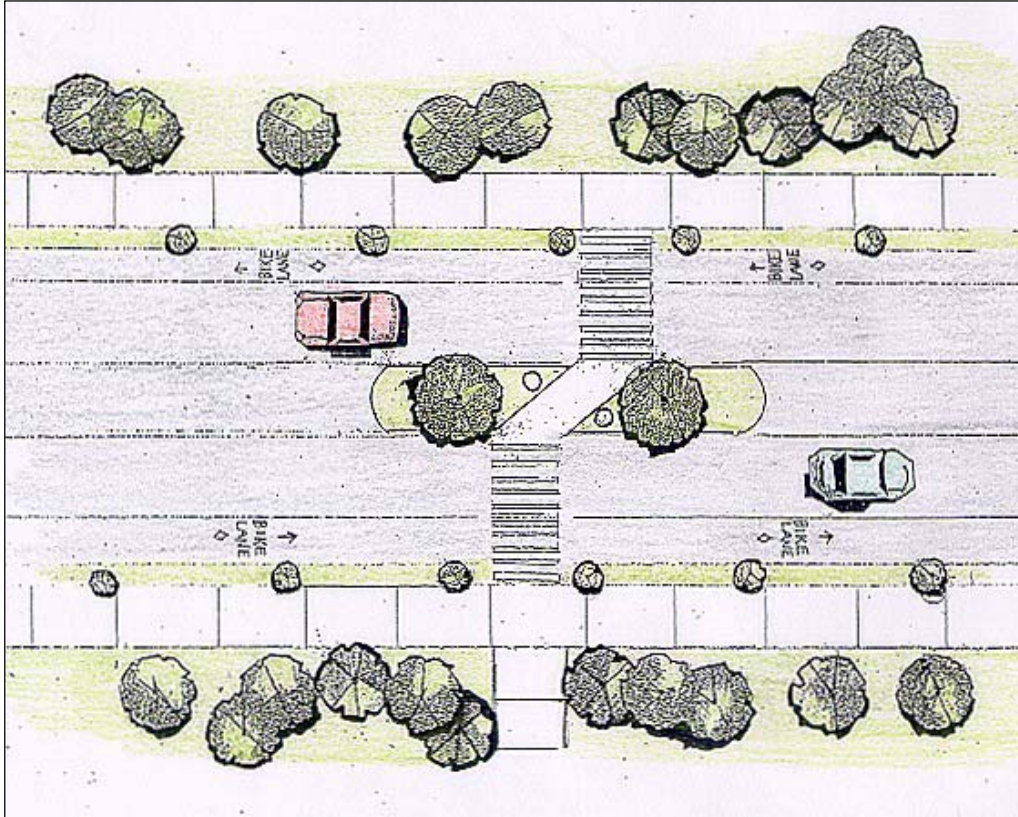


Hillsdale Drive Traffic Safety Study



Sponsored by: Thomas Jefferson Planning District Commission,
Charlottesville-Albemarle MPO, Virginia Department of Transportation,
Albemarle County, City of Charlottesville, Jefferson Area Board for the
Aging, Charlottesville-Albemarle Senior Center, and the
Charlottesville-Albemarle Association of Realtors

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Executive Summary

Study Purpose

This project was initiated at the request of area seniors' organizations to investigate design options to improve safety and walkability on Hillsdale Drive. New development in the area and a potential, future connection to Hydraulic Road will create an increase in vehicular traffic. Residents are concerned that Hillsdale Drive will become more difficult to cross and pedestrian safety will diminish. This is especially an issue given the large concentration of the area population is senior citizens. Proposed improvements should allow all users of the road to feel equally welcome and safe, whether walking, riding a bicycle, driving a car or using transit.

Focus Area

Hillsdale Drive connects a number of residential and commercial service areas that have developed along the east side of Route 29 in suburban Albemarle County. Currently, it extends between Rio Road and Greenbrier Drive, however there are plans to extend Hillsdale to Hydraulic Road. Land uses in the corridor include multi-family apartments, retirement communities, Fashion Square Mall, Food Lion, Church of the Incarnation, Jefferson Area Board for Aging (JABA), the Senior Center, and physical rehabilitation centers. Hillsdale Drive is a two-lane road with a center turn lane, carries 6200-7500 vehicles per day and has a speed limit of 35mph. It also contains bicycle lanes and some sidewalks.

Community Input

Citizens were strongly encouraged to attend public workshops, held at the Senior Center, to discuss values, make comments, identify target spots, and offer suggestions for improvements to Hillsdale Drive. Valuable feedback was received and was used for consideration when evaluating proposed improvements. Agency staff met regularly to review the ideas and draft plans for the targeted areas. Walking audits of the corridor helped to identify issues, mark improvement areas, and develop possible solutions

Needs

The residents, customers, property owners, and guests who live, work, shop, and play along Hillsdale Drive want a livable, healthy street. In order to create that environment, the community desires:

- Reduced vehicular traffic speed and turning controls.
- Safe, convenient pedestrian crossings and walkways, including trail connections.
- Improved transit access.
- Lighting and visibility.

A number of improvements were identified and include both short and long-term solutions. A summary of those follows:

Short-Term Improvements:

- Median crosswalks at Senior Center, Food Lion, and Squire Hill
- Re-stripe travel lanes to reduce vehicle speed
- Sidewalks between Branchlands Boulevard and Mall Drive

- Combine entryways of Our Lady of Peace and Church of the Incarnation
- Roundabout at Greenbrier Drive and Mall Drive
- Trail along southeast Hillsdale, at stormwater ponds, and to the mall from JABA
- Lighting in medians and along walkways for nighttime and rainy day safety
- Increased enforcement of vehicular traffic laws
- Litter clean up and trash receptacles

Long-Term Improvements:

- Raised median crosswalks at JABA, Squire Hill and on Branchlands Blvd.
- Complete sidewalk and trail network along both sides of Hillsdale and side streets.
- Roundabout at Hillsdale and Greenbrier (coordinated with Hillsdale Dr. extension)

Study Area Map



Introduction

Study Purpose

The Hillsdale Drive Traffic Safety Study was initiated by the Senior Center and Jefferson Area Board for the Aging (JABA) to investigate design options to reduce unsafe vehicular motions and improve walkability on the Hillsdale Drive. Residents in the surrounding community are concerned that Hillsdale Drive will become more difficult to cross and pedestrian safety will diminish. This is especially an issue given the large concentration of the area population is senior citizens. Not only do the concerns of the senior population need to be addressed, but also the increase in vehicular traffic that will inevitably occur with new development and a future connection to Hydraulic Road. This project examines and presents possible solution to issues affecting the pedestrian environment. Proposed improvements will allow all users of the road to feel equally welcome and safe, whether walking on foot, riding a bicycle, driving a car or using public transportation.

Study Area

Hillsdale Drive connects a number of residential and commercial service areas that have developed along the east side of Route 29 in suburban Albemarle County. Currently, it extends between Rio Road and Greenbrier Drive. There are plans to extend Hillsdale to Hydraulic Road. Land uses in the corridor include multi-family apartments, retirement communities, Fashion Square Mall, Food Lion, Church of the Incarnation, JABA, the Senior Center, and physical rehabilitation centers. Hillsdale Drive is a two-lane road with a center turn lane, carries 6200-7500 vehicles per day and has a speed limit of 35mph. It also contains bicycle lanes and some sidewalks.

Existing Issues

The Hillsdale Drive study area contains several traffic and pedestrian safety issues. It is a wide road with a central turn lane or painted median. Hillsdale runs parallel to Route 29 and serves an alternate route in and out of downtown Charlottesville. The road carries a significant amount of visitor traffic attempting to avoid the heavy congestion on Route 29. This creates an issue with vehicles speeding through the area. While the posted speed limit is 35 mph, traffic flows closer to 45 mph. Furthermore, since Hillsdale Dr. does not have any traffic signals, motorists rarely have to slow down or stop. Truck traffic also presents a problem. Trucks that attempt to enter downtown Charlottesville via Rio Road east are directed onto Hillsdale Dr. and then routed back to Route 29. Regular trucks access the Post Office, Food Lion, and Toys R' Us. The number of trucks makes the road less pedestrian friendly.

There are several difficult intersections along Hillsdale Drive. Instead of producing a right-angle turns on a flat surface, many of the intersections exist on hills and have poor, irregular alignment. This creates short sight distance for turning vehicles and on-coming traffic. In particular, the intersection of Greenbrier Dr. and Hillsdale Dr. has significant problems. Traveling east on Greenbrier Dr. from Route 29, motorists do not have a definite stop when turning onto Hillsdale Dr. north. Only vehicles coming out of Branchlands Apartments or arriving from Hillsdale Dr. north are required to stop before turning. Pepsi Place carries trucks and Senior Center traffic.

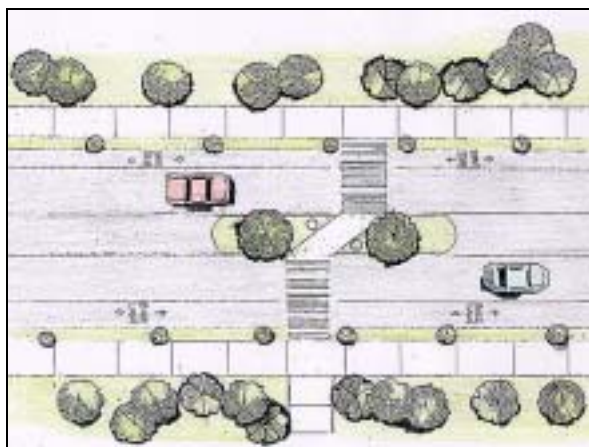
This makes the close intersections of Pepsi Pl., Hillsdale Dr. and Greenbrier Dr. an extended 4-way intersection that is awkward and confusing for drivers.

Presently, the pedestrian network is disconnected along Hillsdale Dr. The fragmented sidewalks and incomplete street crossings adversely affect the mobility of the many senior citizens residents. Senior citizens need safe conditions and more time to walk and cross the street. While sidewalks do exist almost the entire length of Hillsdale, it is on one side or the other. For example, a section of sidewalk will exist along the east side of the road and then it will switch to the west. Lacking distinct markings and good placement, pedestrian crossings do not provide a safe environment. Hillsdale Dr. does not have any median islands to allow pedestrians to stop and rest in the middle of the road. There is also concern about the Canada Geese that cross Hillsdale Dr. to get between the pond and the stream.

Pedestrian Safety Recommendations

Crossings

The most dangerous situation for pedestrians is crossing a roadway, where chances of being struck by a motor vehicle increase dramatically. Therefore, it is necessary to alert drivers of places of high pedestrian activity by installing marked or median crosswalks. Median crosswalks help slow vehicles down and provide a refuge island for pedestrians in the middle of the roadway. The island permits pedestrians to cross one traffic lane at a time, reducing the overall danger of on-coming vehicles. The angled crossing on the center island directs pedestrian's line of sight towards approaching vehicles before crossing the second lane and helps prevent children from darting across the street. Furthermore, the median islands should include proper landscaping and lighting to enhance visibility. Trees should be installed and pruned to maximize pedestrian visibility. Low-growing groundcover does not obstruct the view of approaching motorists, while lighting allows pedestrians to be seen at night. As noted below, median crosswalks are recommended in a number of locations to provide safer crossings for pedestrians.



Median crosswalk design showing landscaping, lighting and angled cross-cut for maximum safety



Well designed median controls and directs both vehicular and pedestrian traffic.



Pleasant pedestrian environment enhanced with landscaped median crosswalk islands.



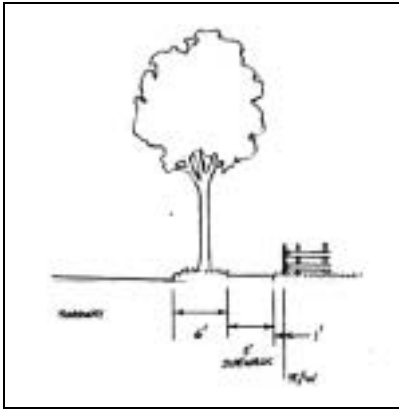
Median island with proper pedestrian markings.

Potential median crosswalk locations:

- Median islands at the intersection of Greenbrier Dr. and Hillsdale Dr. (Senior Center).
A median crosswalk at the intersection of Greenbrier Dr. and Hillsdale Dr. better accommodates senior citizens who desire to walk to residences or business in the area. Able to cross one lane at a time, seniors can feel more comfortable crossing the road.
- On Hillsdale Dr. between Food Lion and Woodlands Day School.
- On Hillsdale Dr. by the Squire Hill tennis courts.
Presently, Hillsdale Drive travels through the middle of Squire Hill Apartments, cutting the complex in half. The median island would provide a safe crossing point and connection for residents who need to use facilities, such as tennis courts, on the opposite side of the apartment complex.
- On Hillsdale Dr. at JABA's southern entrance.
- On Hillsdale Dr. near the entry of Our Lady of Peace and Church of the Incarnation.
- Improved island between Food Lion and Toys R' Us east of entryways (Branchlands)
Placing a median crosswalk at this location supplies an important link in the pedestrian network on the Hillsdale Dr. area. The island provides a safe connection between the Branchlands to many nearby commercial services. Residents can travel to the adjacent grocery store or toy store without getting in their car.
- On Hillsdale Dr. north of Branchlands Blvd. where the median is already painted.

Sidewalks

Safe walkways are essential to pedestrian access and comfort. The sidewalk along Hillsdale Dr. contains missing sections that disrupt a continuous pedestrian network. A complete system is desired along both sides of Hillsdale Drive, connecting all residential, retail and service areas, transit stops and crossing points. Where possible, these should be buffered from the roadway by a strip of grass or plantings. The landscaped buffer further separates pedestrian, bike and vehicular traffic and increases the safety of each mode. It is also strongly recommended that future sidewalks be installed with a 6 foot setback from the curb to increase pedestrian comfort and provide a functional planting strip for healthy shade trees.



New sidewalk standards would require a six-foot planter strip for street trees.



An example of an existing portion of sidewalk along Hillsdale Dr.

Sidewalks are recommended for the following locations in the focus area:

- West side of Hillsdale from JABA to Mall Dr. then to Squire Hill crossing.
- East side from Woodlands Day School to Branchlands Boulevard.
- Along Greenbrier Drive and Branchlands Boulevard to Route 29.
- Mark pathway through parking to connect upper Branchlands town homes with Hillsdale.
- South side of Greenbrier Dr from Pepsi Place to Mill Park Drive (and connection to trail)
- North side of Incarnation Drive from Hillsdale Dr. to Church of the Incarnation.

Trails

Most pedestrians, particularly senior citizens, wish to walk in a peaceful and calm environment. Passing through natural areas and away from traffic, trails should be used to complement and complete the walkway network. The Branchlands and the Church of the Incarnation maintain private trails for residents and members. The Rivanna Trail, an urban trail that encompasses Charlottesville, has a spur that ends at the Senior Center. Where adequate space and conditions exist, public trails should be created to support the pedestrian community. These trails need to be relatively wide, smooth and clear of obstacles, but may not necessarily need to be paved. For added safety, each of the proposed trails should intersect with Hillsdale Dr. at a median crosswalk. Existing bus stop location should be reviewed and coordinated with new crosswalks and trailheads.



Branchlands woods trail.



Potential trail location along Hillsdale Dr.

The locations for possible trails include:

- Along the east side of Hillsdale Dr., behind the existing pear trees and along the sewer line access way.
This path would be well outside the roadway, separated from traffic by an existing guardrail and trees and at a lower grade. The conditions create a safe, quiet, pleasant walk from the Senior Center to Woodlands Day School. This trail would also connect to the existing Senior Center spur of the Rivanna Trail, giving area residents access to an entire trail system. However, if the pond is relocated to create a better Hillsdale extension alignment, the trail would need to move.
- Trails at stormwater detention pond area at Incarnation Drive.
Albemarle County recently purchased this parcel of land and is working to improve its condition and appearance. Albemarle is interested in allowing public uses, creating an opportunity for trail development. Discussions have begun with the Church of the Incarnation for connections to their trails and plans for volunteer landscaping and maintenance.



Stormwater detention area.

- Trail link from JABA to Fashion Square Mall
There is a possibility for a pedestrian connection between Fashion Square Mall and Hillsdale Drive by opening a link between JABA and the mall. A trail would need to be created through JABA's garden to the Marriott Hotel's parking lot. It would then continue through the pine trees and along Hillsdale Dr. at an accessible grade or along sidewalks that already connect to the mall.

Pedestrian Boulevard

Storefronts along eastern Route 29 could eventually be connected by a path that avoids major intersections. Lined with trees and proper landscaping, the walkway through existing parking lots could eventually become a "pedestrian boulevard" (see VDOT Route 29 Pedestrian Plan). Providing a connection between Food Lion and Toys R' Us will help to complete this system, as will a connection to Seminole Square. Pieces of this boulevard already exist along the roadway

to the Marriott Hotel and Westfield Drive. However, topography may limit this concept. Ridges between the commercial developments could act as barriers and create construction problems. The future extension of Hillsdale should be designed to enhance this plan and address the change in grade.

Hillsdale Drive could also become a preferred pedestrian walkway since it will carry fewer and lower speed traffic than Route 29, and service most of the same destinations. People will most likely choose to walk along a tree-lined Hillsdale Drive than the multi-lane Route 29. For this reason, it is vital that pedestrian access along and across Hillsdale Drive be preserved and improved to produce an environment that is safe and welcoming to pedestrian travel.



Route 29 Pedestrian Boulevard concept shown at Fashion Square Mall and Albemarle Square.

Pedestrian Amenities

Benches have been requested to provide a place to sit and rest when taking long walks or waiting for the bus (see Transit). When placing benches along a sidewalk or trail, it is important to find a natural resting place between two points and to leave enough room for passing pedestrians. Benches should not obstruct travel. Lighting placed along walkways or in the median crosswalk will help to maximize safety.

Planting trees and routing paths near buildings with canopies can provide shade and weather protection. As well, litter receptacles at bus stops and other locations will help keep Hillsdale Drive clean and healthy environment. Finally, curb cuts and ramps are needed on sidewalks at a number of locations for handicapped access and to benefit senior citizens. In general, these treatments decrease the chance of a pedestrian accident. Ramping the sidewalk at bus stops creates an easier transition between the sidewalk and bus and decreases the length of stop time.

Bicycles

Hillsdale Drive already has bicycle lanes throughout its entire length, except the last few feet at Rio Road. Extending the network of bicycle lanes onto side streets and to commercial properties will provide the necessary environment for continued and improved bicycle riding in the

corridor. Due to the concrete curb pan, the existing bicycle lanes usable space is slightly narrower than desired. Re-striping the travel lanes to 11 feet, or even 10 feet, would reduce vehicle speed while improving bike and pedestrian comfort and safety. Consideration should also be given to using a 6- or 8-inch stripe or double 4-inch strip for the bike lanes. In turn, traffic operating at safe speeds and making controlled turning motions makes bicycle riding much safer. Bicycle amenities, such as bike racks, will encourage cyclists. Bike racks should be installed at commercial centers, such as Food Lion, Toys R Us, and Fashion Square Mall, and at the Squire Hill and Branchland Apartments. Like pedestrians, cyclists do and will continue to choose Hillsdale Drive as an alternative to Route 29.

Traffic Safety Recommendations

Speed Controls

Motorists drive at a speed they perceive as safe, which is partially related to the road design. Wide lanes, curves in the road, large corner radii, and long stopping sight distance can encourage drivers to travel at speeds that threaten the safety and comfort of pedestrians and cyclists. Using various street treatments, it is possible to control vehicular speed along roadways. Beyond speed limit signs, there are many design factors that influence safety. As discussed earlier, median crosswalk islands calm traffic by increasing awareness of street users. They will help narrow and break up the wide feel of Hillsdale Dr. Other traffic calming options for Hillsdale Dr. include the illusion of less space by expanding the existing bike lanes, planting trees along the sidewalks, and designing tight corners. Altogether, these simple treatments will improve safety along Hillsdale Dr.

Intersections/Roundabouts

Much of the traffic issues on Hillsdale are related to turning motions at intersections and commercial/service access points. A solution to these concerns could be the implementation of roundabouts at certain key intersections. Roundabouts can move traffic at safe, constant and efficient speeds. They simplify intersection movements and supply safer pedestrian crossings.



Well-designed roundabout with splitter islands and pedestrian crossings.



A roundabout in Forest Lakes, Virginia.

Roundabout at Hillsdale and Greenbrier



Roundabout at Hillsdale and Mall Drive



Roundabouts are recommended at two intersections along Hillsdale Dr. to control traffic. These locations include:

- Hillsdale and Mall Drive (Fashion Square Mall rear entrance)
This will reduce the potential for collisions and clarifies turning movements at this curve, hilly intersection.
- Greenbrier Dr. at Hillsdale Dr. and Pepsi Place, with the pond moved to east side of Hillsdale Dr.
A roundabout at this location will require the realignment Hillsdale Drive with Pepsi Place to create a 4-way intersection. The roundabout will move a higher volume more safely with the least impact to surrounding buildings. The pond should be moved to the east side of Hillsdale Dr, making the trail more accessible to seniors. Re-aligning Hillsdale Drive to the west of the pond at Greenbrier Drive will have the added benefit of eliminating the need for Canada geese to cross the road to get to the pond. It will also allow residents of the Senior Center and Branchlands community to visit the geese without having to cross Hillsdale Drive.

Access Management

Conflicts may begin to occur as more entryways are created along a road segment. This is a current problem on Hillsdale Drive between Branchlands Blvd and Mall Drive, and is a potential safety hazard. Some proposed solutions include:

- Combine and relocate the entries to Our Lady of Peace & Church of the Incarnation.
Both properties are owned by the same Diocese, which has expressed interest in combining the two separate entries into a single, central entrance. This would help clear up conflicts at Mall Drive by moving one entry away from the intersection, and better connect the church and retirement center.
- Separate and clarify the center turn lane between the Marriott Hotel and Incarnation Dr.
Because the entries are close together, left-turning traffic conflicts in the center lane. This produces a confusing and unsafe situation for both motorists and pedestrians. Distinct left-turn lanes, rather than the dual center turn lane, is an

immediate solution. Another possibility, the Marriott Hotel entry could move north and share an entrance with JABA. The Marriott Hotel could also change its driving directions, bringing guests in from the north rather than the south. Relocation of the church's upper driveway (discussed above) should reduce the number of cars turning left onto Incarnation Drive.

- Change the width and curb cut radius at all entryways and driveways. Wide vehicle entries create pedestrian conflicts. Narrower parking lot entryways minimize pedestrian crossing distance and control vehicle speeds as they enter and exit the area. Entryways should include a walkway into the property that is safe for pedestrian passage. Zoning and development codes may need to be adjusted so that entrances are designed properly in the future.

Transit

Able to service many destinations along Route 29 north without traffic congestion, transit will soon use Hillsdale Drive as a preferred route through the Route 29 corridor. The road supports a much better pedestrian network for riders walking to or from the bus stop. Pedestrian access to transit services would be improved by providing walkways to all stops and ensuring a close, safe roadway crossing is nearby. The bus stops at Food Lion and Woodlands School should be relocated to align with improved crossings. The bus stop should be located just after the median island to avoid backing traffic up. Other desired bus stop improvements include benches, shade, shelter and wastebaskets. Benches should be the first priority after walkways.



Squire Hill Apts. bus stop.



CTS bus passing the entrance to the Branchlands on Hillsdale Dr.

Trucks

Trucks use Hillsdale Drive to deliver freight to the Post Office and other various commercial locations along the roadway. Trucks are also directed to turn onto Hillsdale Dr. to avoid using Rio Road east, which cannot handle trucks trying to get downtown. Future improvements to the Post Office area may help the former problem, while the planned Meadowcreek Parkway will alleviate the latter problem. One short-term solution could be a better signage on Route 29 informing trucks how to get downtown without turning onto Rio Road east. But, trucks will continue to use Hillsdale and should be calmed just like automobiles by proposed improvements. Their access should also be improved as a result of proposed solutions. Freight traffic should not pose a problem in the future.

Visibility

Streetlights should to be installed at all crossings and along portions of the sidewalk. Providing illumination will increase nighttime safety at many locations. It ensures that motorists see pedestrians and minimizes the opportunity for criminal activity. Light fixtures need to be lower, more human scale, and in accordance with Albemarle County's outdoor lighting ordinance to preserve the dark sky. For additional safety, reflectors could be imbedded in the roadway to mark lanes and crosswalks in the rain, fog, or dark.

Implementation

In order to complete the pedestrian network, some access will need to be created through parking lots and other private property areas. Discussions with the owners should begin before final location of crossings and walkways is determined to ensure adequate access is created by design. (Food Lion, Woodlands Day School, Branchlands, JABA)

Recommendations from this plan will need to be included in the Long Range Plan and TIP in order to be eligible for funding. Localities and the MPO should work with VDOT to ensure the ideas are approved and added to these documents. Hillsdale Drive has approximately 100 feet of right-of-way to use when making improvements.

Estimated Costs

Sidewalks (short term)		<u>@ \$100 per foot</u>
Mall Drive to north JABA entry	625 feet	\$62,500
JABA entry to entry	260 feet	\$26,000
Marriott Hotel	190 feet	\$19,000
Toys R' Us	320 feet	\$32,000
Woodlands Day School	205 feet	<u>\$20,500</u>
		\$160,000
Trail by Pear trees	1250 feet @ \$21 per foot	\$26,750
Median Crosswalks	7 @ \$15,000 per island	\$105,000
Roundabouts	2 @ \$50,000-\$100,000 each	\$100,000-\$200,000(more for pond relocation and alignment)
Bus stop amenities	7 benches @ \$300 each	\$2,100
Lighting	7 @ ~\$1,000 per light	\$7,000
	TOTAL	~\$400,000

Potential funding sources for these improvements include Secondary Road, Safety and Spot Improvement, Capital Improvement Programs, or Hazard Elimination Program funds, donations from property owners, and grants, such as Transportation Enhancements or Community Development Block Grants. Money from the Hillsdale Dr. extension could be used to construct the roundabout at Hillsdale Dr. and Greenbrier Dr. It is also recommended to apply some of the design concepts of this study to the new portion of Hillsdale Drive.

Appendix B: Planning Process

The TJPDC/MPO develops its plans using strategies that will achieve the goals of specific planning factors. The manner in which this project supports those goals are listed under each factor below:

Support the economic vitality of the MPO area:

- Improves vehicular, transit, and pedestrian access to commercial areas.
- Relieves congestion on the area's busiest commercial corridor, which delivers both customers and employees.
- Saves taxpayer money with low construction and maintenance costs.

Increase safety and security of the transportation system for all users:

- Includes safety provisions for pedestrian, transit, bicycle, and vehicular travel.
- Improves safety of all modes by reducing speed and confusion.
- Roundabouts improve safety.

Increase accessibility and mobility options for people and freight:

- Increases bicycle and pedestrian safety and facilities.
- Improves transit circulation.
- Improves access to the post office and retail stores that require freight service.

Protect and enhance the environment, and quality of life:

- Provide access to natural areas with trails.
- Controlled speeds improve air quality.
- Increase pedestrian and bicycle allows more physical exercise.

Enhance integration and connectivity across and between modes, for people and freight:

- Aligns pedestrian crossings with transit stops.
- Roundabouts allow for improved multi-modal integration.

Promote efficient system management and operation:

- Provides calm, low speed traffic flow without signals.
- Clarifies pedestrian zones to minimize confusion.
- Allows transit to operate more smoothly north-south.

Emphasize preservation of the existing transportation system:

- All improvements are along existing Hillsdale Drive.

Appendix C: *Why Modern Roundabouts rather than signals?*

As outlined in the plan, two modern Roundabouts are proposed for consideration. Single-lane roundabouts are appropriate for roads like Hillsdale Drive and its proposed extension. It should be noted that while roundabouts would provide significant benefits over signalized intersections at these locations, all intersections could be built with signals instead of roundabouts, although with less capacity, safety, and more delay. The signalized intersections would also typically require wider roads than roundabouts, to allow for added lanes to stack vehicles waiting to turn.

Modern Roundabouts are not traffic circles. The older traffic circles that many drivers are familiar with tend to be larger, operate at higher speeds, provide little protection for pedestrians or bicyclists, and are less safe for all users. Many have even been modified to add signals. Modern Roundabouts are carefully designed to provide a tightly controlled environment that balances the flow of all vehicles and turning movements, while greatly improving safety, capacity, and pedestrian access. This is accomplished by very specific geometric design details that channel vehicle and pedestrian movements to the best location, reducing conflict points.

Roundabouts are not new to Central Virginia, although many more are being proposed for problem intersections. Last fall, a staff team from VDOT, County, City, and TJPDC worked with the Jefferson Area Board for the Aging and the Senior Center to develop safer pedestrian crossings for existing sections of Hillsdale Drive. After an extensive public involvement and education campaign, both roundabouts and median crosswalks were identified as the community's preferred solutions. The Team's engineering consultant, Michael Wallwork, is one of the country's top roundabout designers, and has recently been on teams to design roundabouts at the entrance to Scottsville, at the Airport entrance, and for a Route 50 project. Mr. Wallwork also trained local and VDOT staff to use aaSIDRA, the software used for analysis of signals vs. roundabouts.

Roundabouts are safer than signalized intersections or stop signs. A recent study by Virginia's own Insurance Institute for Highway Safety reviewed before-and-after crash data for 24 roundabouts in 8 states that had replaced either signals or 3 and 4-way stop signs. The study found highly significant reductions in crashes of:

- ❑ **39 %** reduction for all crash severities combined;
- ❑ **76 %** reduction for all injury crashes;
- ❑ **90 %** reduction for fatal and incapacitating injury crashes.

“Overall, results are consistent with numerous international studies and suggest that roundabout installation should be strongly promoted as an effective safety treatment for intersections.” (IIHS, Richard Retting et.al., 2000).

Roundabouts have greater capacity and less delay than signalized intersections. The SIDRA analysis software – which is approved by Federal Highways Administration and 49 out of 50 state DOT's – is a very precise tool for measuring levels of service, capacity, length of delays, and lane requirements. SIDRA typically shows that a two-lane road with roundabouts will provide higher capacity, smoother traffic flow, higher level of service (LOS) and less delay than

a four-lane road with signals. This is partly due to a more constant flow, with no need to stop all movement to allow left turns in one direction. The same is true of two-lane roundabouts; a two-lane roundabout with four-lane approach roads (with medians) would require a six-lane signalized road for equal capacity.

Roundabouts improve pedestrian access and safety over typical signalized intersections, if properly designed. Required details include:

- ❑ **Median splitter islands** at each approach, allowing pedestrians to cross only one direction of traffic at a time.
- ❑ **Crosswalks set back one car length** (18') from the edge of roundabout, so drivers are looking directly at pedestrians, rather than looking left at approaching vehicles. Even in busy traffic, the second approaching vehicle will yield to pedestrians while the first is entering the roundabout.
- ❑ **Landscaped center islands** and lane deflection (no straight shot through) so that approaching vehicles see the changed intersection and have to slow down on approach. A typical design speed is 18 to 23 mph.
- ❑ **Clear signs and lane markings** so drivers and pedestrians know where to go and what to expect.

Roundabouts accommodate trucks and buses. Good designers use templates to define the required travel path of larger vehicles. A truck apron is usually provided to allow larger vehicles like moving vans to get around, while still maintaining the appropriate geometry to reduce speeds of normal vehicle. This truck apron is usually around the outside edge of the landscaped center island, made of bricks or concrete, with a mountable curb 2 ½ inches above the pavement.

Roundabouts are good for business. Many communities have discovered that a well-designed traffic control device can spark revitalization of a declining business district, by reducing speeding traffic, providing a beautiful focal point, and improving customer access.

Roundabouts require education. This is relatively easy, since the actual movements are simple. After approaching and yielding to any pedestrian or vehicle already in the roundabout, all any vehicle can do is make a right turn to get in, and another right turn to get out. Clear signage for these movements has already been developed and approved by FHWA. Many Team members have also developed educational campaigns, videos, and other creative educational tools.

Fortunately, the likely phasing of improvements would include a roundabout constructed at Airport Road prior to this project. This phasing would allow drivers to get used to the changed patterns gradually.

Appendix D: Public Comments and Workshop Data

Hillsdale Drive Traffic Safety Workshop - Senior Center - June 19, 2002

DOT Priorities:

<u># of dots</u>	<u>Priority</u>
11	Shorter, quicker, smoother, more accessible sidewalks (ie. Rosewood Village to Senior Center)
11	Hillsdale Drive at Greenbrier Drive
10	Running stop sign at Hillsdale Drive & Greenbrier Drive, and turning confusion
9	Sidewalks Incomplete
8	Entrance to Our Lady of Peace
7	Hillsdale Drive, Church of the Incarnation, and the Marriott Complex intersection
7	Safety Islands at all crossovers
6	Should be a 3-Way stop at Pepsi (need a stop light)
6	Need crosswalk at Hillsdale Drive and Branchlands Blvd.
6	No stopping/standing at geese (to feed them)
6	Elder Crossing signs at various locations
5	Branchlands Blvd. at Hillsdale Drive
5	Hillsdale Drive & Greenbrier Drive
4	Bus stop – need to be able to cross street, need crosswalk, at Incarnation Drive
3	Fix problems on Hillsdale Drive before it is connected to Hydraulic Road
2	Pepsi Place & Greenbrier Drive
2	Hillsdale to Food Lion
2	Access from Hillsdale Drive to Fashion Square
2	Steps from Food Lion to street
2	Move stop “bar” back at Greenbrier Drive
1	More streetlights along Hillsdale Drive
1	Pedestrian crossing at Route 29

Hillsdale Drive Traffic Safety Workshop - Senior Center - June 19, 2002

Group 1 Priorities

- Extending/Putting sidewalks along Hillsdale
- Rivanna Trail – extend sidewalk to trail and upgrade sidewalk to be more like a trail
- 3-Way stop at Greenbrier Drive and Hillsdale Drive
- Have county clean up the pond
- Bus stops need shelters/shade.
- Need to reduce the scale of the road to “human scale” (like trees)
- Move sidewalk construction up on schedule
- Create islands
- Reduce speed limit
- Find out about Fashion Square parking, and whether there could be more residential use
- Trail from Our Lady of Peace to ...
- More people along the streets would make people slow down
- Flashing lights
- Access to Food Lion

Group 2 Priorities

- Cut through of road [Hillsdale Connector]
 - Some don't want it
 - Others just want it designed for slow speed and pedestrian safety
- Smaller buses
- Education about bus rider ship
- 3-Way stop sign
- Pedestrian islands in middle of roads. Place to rest as pedestrians cross the street.

Group 3 Priorities

- Crosswalks (it is impossible to cross Rt. 29 at Greenbrier)
- Need sidewalks all the way
- Pepsi Place – marking spaces for overflow when needed
- Crosswalk – Branchlands to Food Lion, it is so bad you need JAUNT to cross the street.

Group 4 Priorities

- Sidewalks from the intersection of 29 & Greenbrier, and all along
- Fashion Square & Our Lady of Peace intersections are too close. Combined Our Lady of Peace's intersection with the Church of the Incarnation
- Islands
- Move crosswalk to where it isn't “blind”
- 3-Way stop sign, or roundabout, or traffic light

Make connections between parking lots

Change color of signs to green – to draw motorists attention

Repaint crosswalks to different positions

Paint islands for crosswalks until permanent islands can be constructed.

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Post-it Priorities:

<p>TRAFFIC</p> <ul style="list-style-type: none"> -Less thru-traffic -Traffic control <ul style="list-style-type: none"> *Signals *Signs *Speed reduction *Enforcement *Lane markings -Better roadway lighting -Connectivity 	<p>ENVIRONMENT</p> <ul style="list-style-type: none"> -Geese -Stormwater/Ponds -Litter/Beauty -Air Pollution
<p>SAFETY</p> <ul style="list-style-type: none"> -Security -Safety from cars -Police presence -Reduce crime 	<p>GROWTH/LAND DEVELOPMENT</p> <ul style="list-style-type: none"> -Control it -No business or residential -Scale/neighborhood -Save historic
<p>PEDESTRIAN</p> <ul style="list-style-type: none"> -More sidewalks -More/better crosswalks -Closer services/businesses -Paths where appropriate <ul style="list-style-type: none"> *Boardwalks 	<p>COMMUNITY</p> <ul style="list-style-type: none"> -involvement -all inclusive -diverse -people/family/friends
<p>TRANSIT</p> <ul style="list-style-type: none"> -Local public -Long distance/commuter rail 	<p>BIKES</p> <ul style="list-style-type: none"> -more -less (take out lane)
<p>HEALTH</p>	<p>MOBILITY/ACCESSIBLITIY</p>
<p>PEACE & PROSPERITY</p>	<p>EDUCATION</p>

Hillsdale Drive Traffic Safety Workshop #2 - Senior Center – October 23, 2002
Agency staff + 20 public participants

Priorities

- 1 - Median Crosswalks – A then B/C
- 2 – Intersections – A/D/G
- 3 – Sidewalks and trails

General Comments

Trucks use East Rio to Hillsdale because they are not allowed down east Rio and end up stuck on Hillsdale. Better education and signage would prevent many from turning up Rio to begin with. Hillsdale is currently a truck route, and trucks service businesses including the mall, Toys R' Us, Food Lion, and the post office.

Check into a sidewalk through Woodlands Day School to provide Branchlands residents better access to Hillsdale.

Reducing vehicular speeds improves everyone's safety

Stop bar at Branchlands Ave. needs to be moved forward

Left turns near Marriott need to be addressed. The center turning lane does not prevent head-on accident risks due to overlapping driveway cuts.

Move island to Food Lion north about 50 feet – needs stairs/ramp – combines with Branchlands island?

Move Squire Hill Island to tennis courts/sidewalk leg (south 200 feet)

Bus Stop locations can be moved to align with crosswalks, and all should have litter cans.

Roundabout will require education programs, particularly with elderly users (video)

Can a trail be built in the very near term along the pear trees near Greenbrier – check guard rail.

Put street lights in islands



Public Workshop Discussion