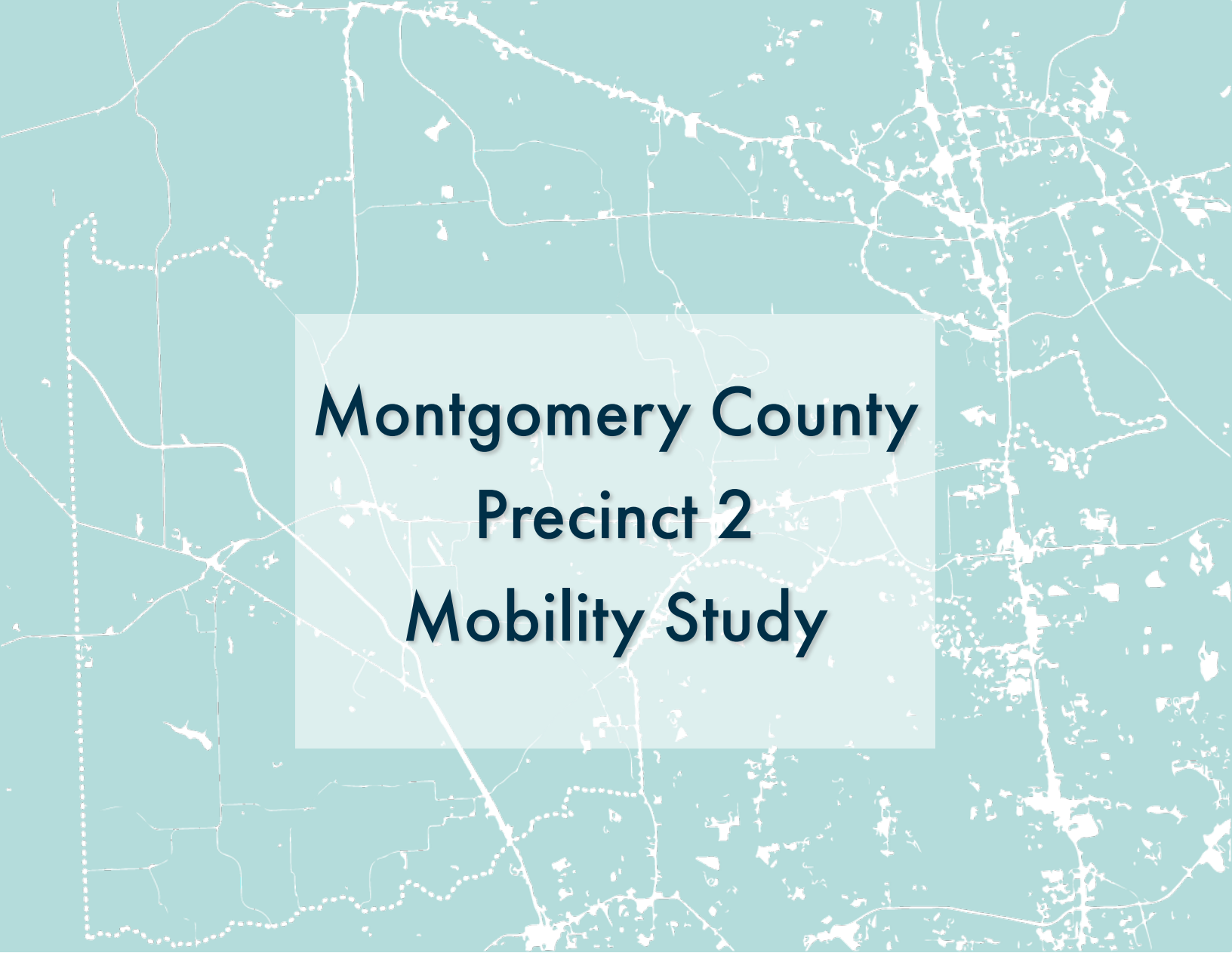


APPENDIX D

Issues and Needs



Montgomery County Precinct 2 Mobility Study

Appendix D Issues and Needs

October 2021



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I. Introduction

As a part of the Montgomery County Precinct 2 Mobility Study, mobility needs and issues in the study area have been identified using input from the steering committee, focus groups, public, and data analysis. The study team has collected a variety of existing conditions data for the region, including existing roadway conditions, crash data, planned developments, and traffic data.

II. Input

Table II-1 shows a list of major issues identified in Precinct 2 from the steering committee, stakeholder groups, and public input.

Table II-1: Major Identified Issues

Major Issues	Steering Committee	Focus Groups	Public Input
Traffic Congestion	X	X	X
Dangerous Road Curves	X	X	X
North/South Connectivity	X	X	X
East/West Connectivity	X		X
Transit Needs	X	X	
Intersection Congestion	X	X	X
Need Bike Routes	X	X	X
Corridor Signal Timings	X	X	X
Railroad Crossings	X	X	X
Flooding near IH-45/SH242	X		X
Extend Old Conroe Road	X	X	X
FM 2978 Construction	X	X	X
School Traffic	X		X
Safety - Crashes	X	X	X
New Developments	X		X
Hospital Access		X	
Need Turn Lanes			X
Access Management			X
Need Road Widening			X
Need Street Lighting			X
Signing and Pavement Marking			X

A. Steering Committee

Issues and needs brought up by the steering committee are summarized below.

- Congestion
 - Intersections:
 - FM 1488 at FM 2978/Honea Egypt Rd
 - FM 1488 at FM 1774/Melton St
 - Both traffic congestion and railroad delays
 - FM 1774 at Buddy Riley (after train)
 - IH-45N at SH 242
 - Medical traffic
 - Nichols Sawmill Rd at Commerce St
- Construction on FM 2978
 - Taking too long
 - Difficult access to business and has led to business closures
- Need for east-west corridors and north-south corridors
 - Between FM 2978 and SH 249
 - FM 1488 corridor needs relief, especially in Magnolia
 - Additional signals on existing corridors are reducing east-west mobility
 - Magnolia to IH-45N
 - Old Conroe Rd extension
 - New connections to SH 249
- Safety
 - Difficult to cross traffic to make left turns to/from retail and business
 - FM 1488
 - FM 2978
 - Crashes
 - FM 1488 at FM 2978/Honea Egypt Rd
 - Nichols Sawmill Rd at Old Hockley Rd
 - FM 149 at Keenan Cut-Off Rd
 - "S" curves
 - Walnut Creek at Lonesome Pine
 - Hardin Store Rd at FM 2978
 - FM 149 just north of Lake Creek
 - Raised medians needed:
 - SH 105
 - FM 1488

- Pedestrians crossing IH-45N
 - Multiple locations
 - Many around hospital areas (SH 242)
- Roadway capacity
 - FM 2854 needs additional capacity
 - Nichols Sawmill Rd needs widening
 - Kuykendahl Rd needs to be widened from FM 1488 to Research Forest
 - FM 149 and FM 149 need additional capacity due to construction of SH 249
 - Widen Old Conroe Rd
 - Widen Hardin Store Rd
- Signal Timing
 - FM 1488 at FM 1774
 - Traffic backs up at intersection
 - Eastbound green time too short
 - FM 1488 corridor signal coordination
- Turn Lanes
 - Delay for left turns:
 - Old Hockley Rd at Nichols Sawmill Rd
 - Nichols Sawmill Rd at Grand Pines Rd
 - Grand Pines at Mueschke Rd
 - Additions and extensions needed for:
 - Research Forest at Kuykendahl
 - Research Forest at Egypt Ln
 - FM 1488 at FM 2978
- Flooding
 - IH-45N at SH 242 – roads flood with moderate rain
- Bicycle
 - Need more bike routes
 - Easement bike paths near FM 1488
 - Safe bike crossing for FM 1488

***B.* Focus Groups**

Issues and needs discussed by the focus groups are summarized below.

- Safety
 - Supports Vision Zero
 - IH-45N frontage road near SH 242 – high speeds
 - Difficult for emergency vehicles to access driveways
 - Flooding

- Crashes at Research Forest Dr at Grogan's Mill Rd
- Many long dead-end roads or roads that loop with one entrance
 - Safety issue for wildfires and flooding
- Crashes on FM 1488
 - Pedestrian/bicycle related crashes
 - Two-Way Left Turn Lane (TWLTL) – dangerous left turns into business near intersections
- FM 149
 - Fatal accidents
 - No shoulder
 - Limited sight distance
 - High speeds
- Congestion
 - Difficult to travel across region after 3:00 PM, especially on FM 1488
 - Railroad causes traffic backup in Magnolia, and always seems to happen during bus times
 - SH 105 – occasional slowdowns caused by wide-load trucks
 - Hardin Store Rd
 - Kuykendahl, especially portion that has not been widened
 - FM 1488
 - IH-45N
 - Congestion affects school buses
 - Pass-by traffic impacts local traffic
 - Old Conroe Rd needs widening
 - SH 242
 - School zones and signal timings causing issues in morning
 - Intersections:
 - IH-45N at SH 242
 - Access roads difficult to navigate for emergency vehicles, especially SBFR
 - Need additional direct connectors (EB to SB)
 - IH-45N at Research Forest Dr
 - There are improvements underway
 - FM 1488 at SH 242
 - FM 2978 at Woodlands Parkway
 - SH 105 at Walden Rd
 - FM 1488 at Carriage Hills Blvd
 - FM 1488 at Old Conroe Rd
 - FM 1488 at Kuykendahl Rd

- FM 1488 at FM 1774
- FM 1488 at FM 2978
- Research Forest Dr at Gosling Rd
 - Transit from Research Forest P&R
- Buddy Riley at FM 1774 and at FM 1488
- Connectivity
 - Need more east-west connectivity
 - Hardin Store is one of few options between SH 249 and FM 2978
 - Impacts emergency response times
 - Impacts school bus schedules
 - Need north-south connectivity
 - Difficult for Woodforest feeding into Conroe High School
 - IH-45N congestion
 - Need to add as many railroad grade separations as possible
 - Difficult to get from SH 249/FM 1774 to Nichols Sawmill Rd
 - Difficult for fire trucks to access southwestern portion of Precinct 2
 - Old Conroe Rd
 - Needs alternate access (only one way out towards FM 1488)
 - Connect Woodlands Parkway from FM 2978 to SH 249
 - T-intersections impact mobility
 - Need additional connection from FM 149 to SH 249
 - Need Nichols Sawmill to FM 1488 connection
 - Connect FM 1488 to FM 2854 along Superior Rd
 - Need Magnolia relief route
 - Need regional loop roadway
 - Not enough options/alternative routes in region
- Alternate Modes
 - Connect existing pathways between The Woodlands and Shenandoah
 - Path goes to Research Forest Dr at Grogan's Mill Rd, but does not connect across intersection
 - Pedestrian and bike trails needed, especially in Magnolia area
 - Quality of life
 - Need more protected bike lanes
 - Remove jutting curbs
 - Utility easements could be used for shared-use paths
 - FM 1488 has a lot of cyclists using shoulder, but roadway is not marked
 - FM 2854 has heavy bicycle traffic
 - Currently no shoulders or paths for cyclists near IH-45N and SH 242
 - Need safe routes for cyclists and pedestrians to access medical facilities

- Need regional bicycle master plan
- Frequent bike traffic on 2-lane roads with no shoulders or other bicycle facilities
 - Old Conroe Rd
 - Twin Lakes Rd
- Need park-and-ride facilities
 - Magnolia
- Magnolia – The Woodlands transit connection
- Need carpool, car share, and/or ride share programs
- Need car alternatives
- Access Management
 - SH 105
- Construction
 - FM 2978 construction
 - Impacted Magnolia Fire Department response times
 - Impacted access to businesses

Table II-2: Public Input Categories

Category	Number of Comments
Congestion and Delay	52
Safety	35
Access and Connectivity	19
Bike/Pedestrian/Transit	5
Other	2

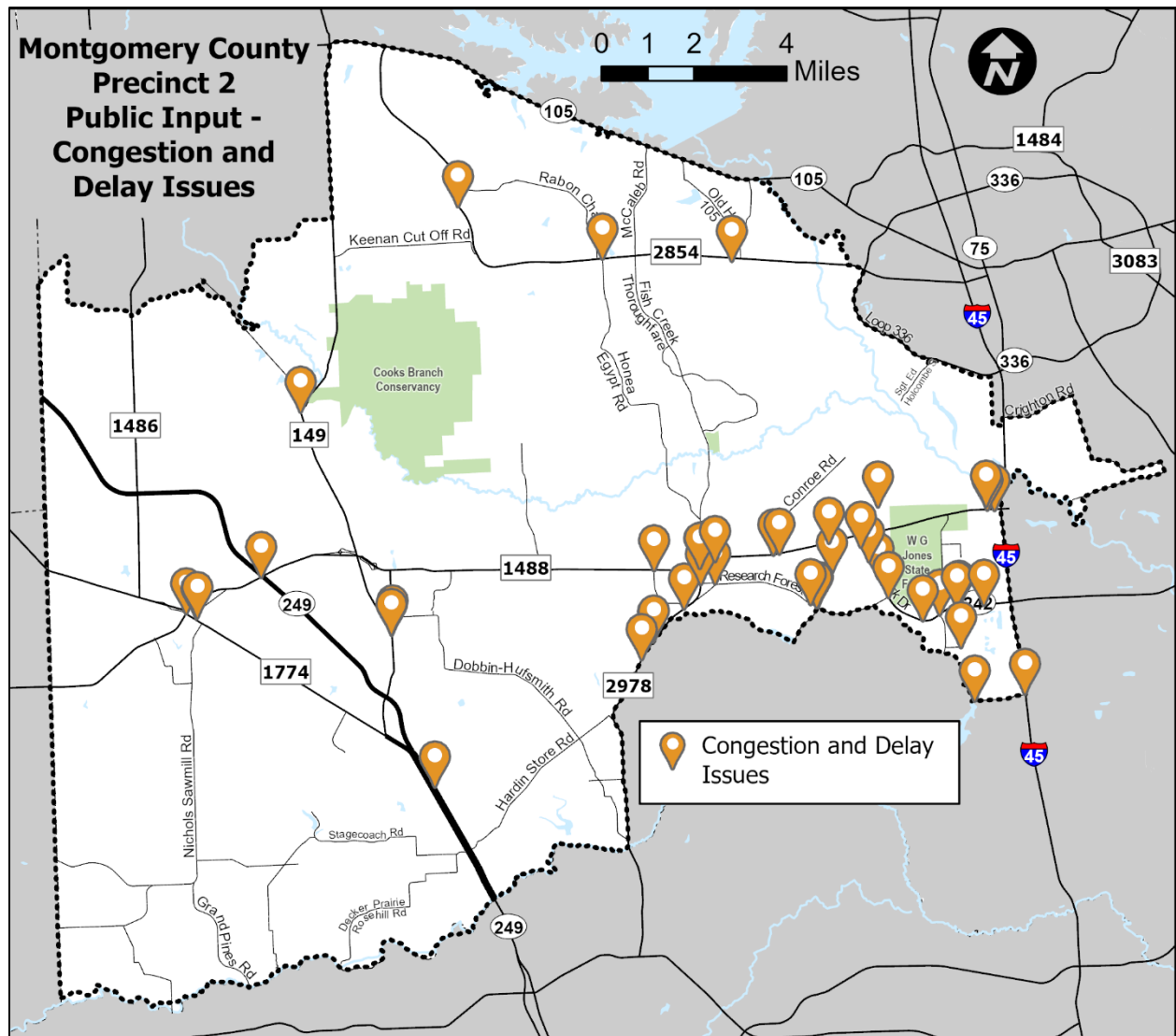


Figure II-2: Public Input - Congestion and Delay Issues

Most of the comments related to congestion and delay are in the southeast portion of the precinct, particularly along FM 1488, SH 242, FM 2978, Spur 149, FM 2854, and Research Forest Dr. There were 6 congestion comments related to the intersection of FM 1488 at FM 2978/Honea Egypt Rd and 5 congestion comments for the intersection of FM 149 at Spur 149.

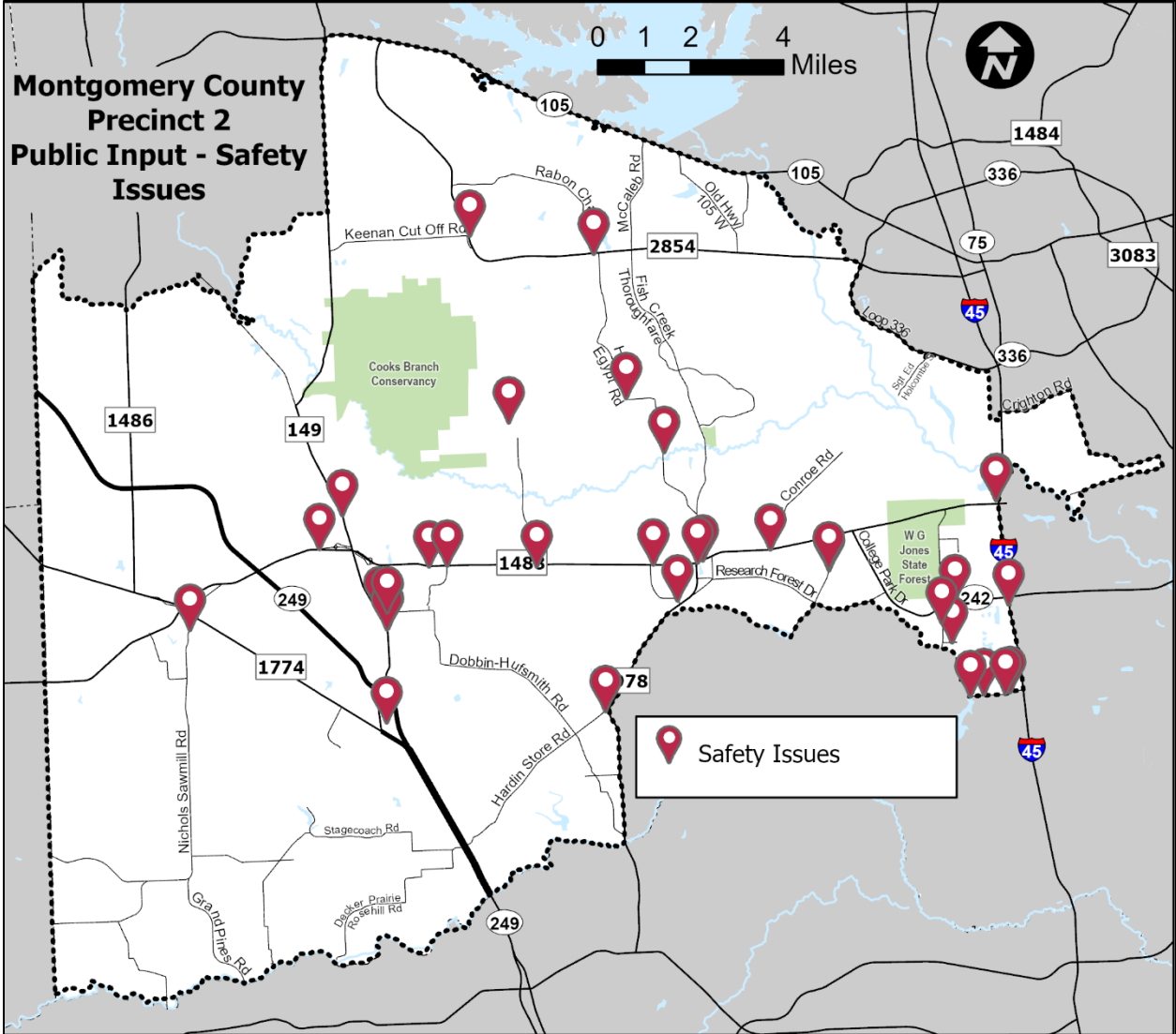


Figure II-3: Public Input - Safety Issues

Many of the public comments related to safety were along FM 1488. There were also several comments along Spur 149, FM 149, Research Forest Dr, and Honea Egypt Rd. The intersection of FM 149 at Spur 149 had 5 safety related comments, and Spur 149 at Dobbins-Hufsmith Rd had 3 safety comments. Safety issues mentioned included dangerous crossing/turning onto busy roads, curves, weaving traffic, limited visibility, and lack of alternate access for emergency response.

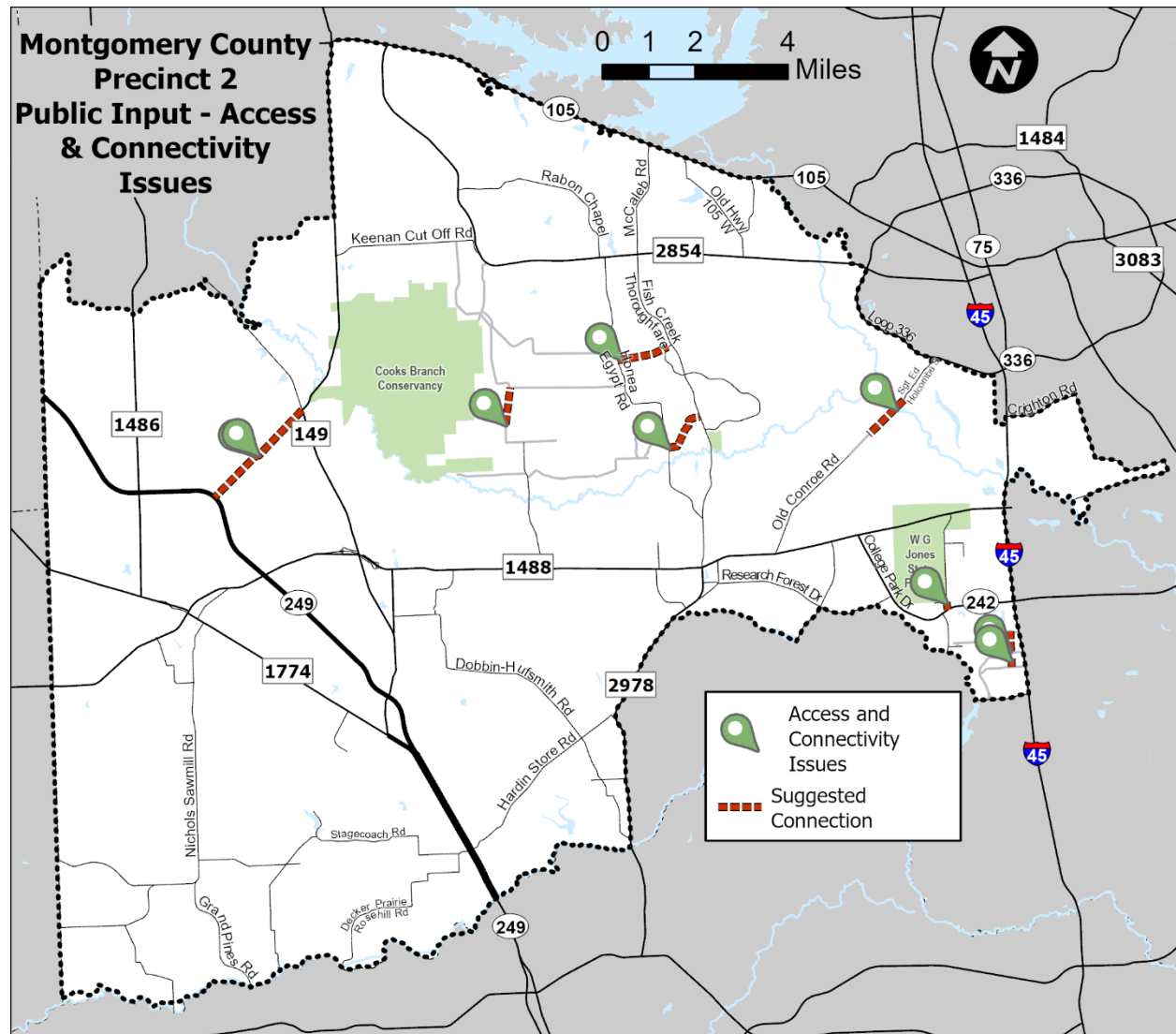


Figure II-4: Public Input - Access and Connectivity Issues

One of the main concerns expressed relate to access and connectivity is a lack of east-west and north-south corridors. Some of the suggested east-west corridors were between FM 149 to SH 249, between Honea Egypt Rd to Fish Creek Thoroughfare, and between Old Conroe Rd to Sgt. Holcombe Rd. Suggested north-south connections were between Peoples Rd to Gosling Rd, from Pine Forest Dr to St Luke’s Way, between Pine Forest Dr to Wellman Rd, and between Corrolla to Grand Lake Estate Dr. Figure II-4 shows the pinned location in green. The approximate route suggest by the pinned comment is shown with a red dashed line.

steering committee, focus groups, and the study team. Table II-4 shows the responses to the Steering Committee & Focus Group Issues, and Table II-5 shows the responses to the Study Team Issues.

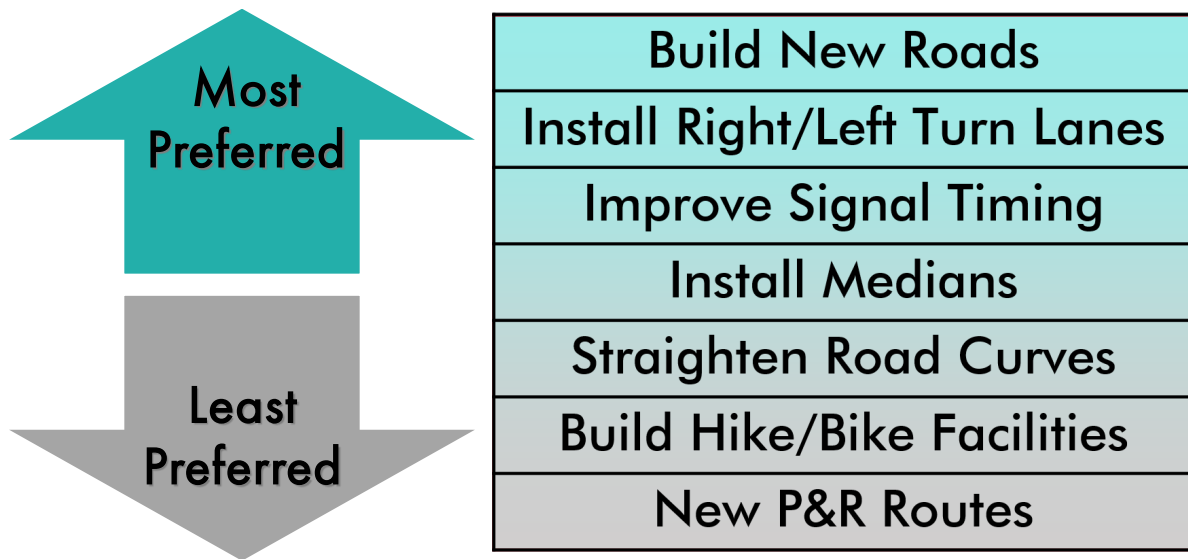


Figure II-7: Ranked Mobility Issues

Table II-3: Ranked Mobility Issues

Mobility Issue	Ranking						
	1 (Most Preferred)	2	3	4	5	6	7 (Least Preferred)
Build New Roads	28	12	13	7	5	6	10
Improve Signal Timing	18	17	18	9	10	3	6
Install Right/Left Turn Lanes	14	24	13	17	7	4	2
Install Medians	13	9	15	19	18	6	1
New P&R Routes	4	7	4	2	11	19	34
Straighten Road Curves	2	6	13	17	15	23	5
Build Hike/Bike Facilities	2	6	5	10	15	20	23

Table II-4: Public Opinion on Steering Committee & Focus Group Issues

Steering Committee Issue	Agree	Disagree
<i>Dangerous Road Curves</i>	49	32
<i>Extend Old Conroe Road</i>	47	34
<i>Flooding near IH-45/SH 242</i>	60	21
<i>FM 2978 Construction</i>	74	7
<i>Hospital Access</i>	51	30
<i>Improve Signal Timings</i>	67	14
<i>Lack of Commute Options</i>	55	26
<i>N/S & E/W Connectivity</i>	68	13
<i>Need Bike Routes</i>	46	35
<i>Railroad Crossings</i>	46	35
<i>Safety - Crashes</i>	69	12
<i>School Traffic</i>	65	16
<i>Traffic Congestion</i>	79	2

Table II-5: Public Opinion on Study Team Issues

Study Team Issue	Agree	Disagree
<i>Intersection Improvements</i>	74	7
<i>Lack of Road Connectivity</i>	70	11
<i>Limited Sidewalks/Bike Trails</i>	55	26
<i>Limited Transit Options</i>	51	30
<i>Natural and Man-made Barriers</i>	58	23
<i>Improve Safety</i>	76	5

Some of the key issues identified by the public include:

- Congestion and delay on FM 1488 at FM 2978
- Issue with signal coordination along SH 242/College Park Dr
- Issue with IH-45N and FM 1488 interchange traffic operations
- Congestion and safety issue on FM 149 at Spur 149
- Cut-through traffic on Tamina Rd
- Illumination, drainage, and signal coordination issue on Research Forest Dr
- Bike safety along Honea Egypt Rd
- Speeding on FM 1488 east of FM 149

III. Identified Issues and Needs by the Study Team

Using input and data collected for the mobility study, the study team has identified the following as overall issues and needs affecting Montgomery County Precinct 2:

- Intersection Improvements
- Lack of Road Connectivity
- Limited Sidewalks/Bike Trails
- Limited Transit Options
- Natural and Man-made Barriers
- Safety

A. Intersection Improvements

There are a substantial number of intersections in Precinct 2 that are already heavily congested during peak times. With significant projected region growth and the currently limited number of major routes, it will be essential to make improvements to existing intersections to reduce delay and improve overall regional mobility. Below are listed some needed improvements to existing intersections.

- Signal timing
 - All the major corridors with signalized intersection in the region need to be looked at for signal coordination
 - Corridors with existing coordination should have offset times assessed.
 - Routine assessment of signal timings should be implemented, especially as regional growth changes traffic patterns
 - Signal timing and phasing for major congested intersections
- Turn lane capacity
 - Many intersections currently have insufficient storage for turning vehicles, which can also impact through movements
 - Extend existing turn lanes
 - Adding turn lanes (left/right) where ROW permits, or acquire additional ROW
- Turning radius
 - Adjust corner turning radii at intersections where large emergency vehicles, transit buses, and school buses frequently turn
- Railroad grade separation
 - Remove existing at-grade railroad crossings with over- or underpasses at major intersections, especially for FM 1488 at FM 1774
 - Grade separation will remove back-ups caused by trains on major roadways
 - Grade separations are a major safety improvement

B. Lack of Road Connectivity

There are limited east-west and north-south corridors that extend across the entire region. There are many locations where roads end in T-intersections or dead ends. This disrupts connectivity and forces more traffic onto fewer routes.

The lack of alternative routes is a major issue for the region, and impacts not only commuters, but also emergency responders and schools. Many of the existing routes have insufficient capacity or unsafe alignments.

There is a need for more direct roadway connections between the cities, large commercial areas, medical facilities, and educational institutions inside Precinct 2.

C. Limited Sidewalks/Bike Trails

Overall, there are limited and disjointed sidewalks, bike trails, and shared use paths within Precinct 2. The portions of The Woodlands and Shenandoah within the Precinct do have a network of trails, but there are several locations where it is disconnected. There is a short stretch of sidewalk along FM 1774 in downtown Magnolia which is not connected to any other sidewalk networks. There are also some sidewalks and shared use trails in subdivisions, including Cimarron Creek, Fosters Ridge, Glen Oaks, Grand Central Park, Jacobs Reserve, Woodforest, Woodhaven Forest, and Woodtrace, but these do not connect to each other or to places of employment or commercial development.

Many frequented bike routes along major FM roads are not well signed to alert drivers, and other bike routes do not have shoulders or separated facilities for cyclists. There are also locations with shoulders that have jutting curbs at intersections, which forces cyclists to enter the main travel lane or dismount and cross grassy area to sidewalk.

D. Limited Transit Options

The existing transit options for Precinct 2 are very limited. There is only one Park and Ride locations within Precinct 2, the Research Forest Park & Ride near Marsico Pl and Gosling Rd, which connects to the Texas Medical Center, Greenway Plaza, and Downtown Houston. There is a Demand & Response service from the Brazos Transit District outside of the urbanized areas in Montgomery County. There is some fixed route transit in adjacent precincts, including the Conroe Connection and The Woodlands Town Center Trolley, but these do not connect to Precinct 2.

Currently, there are no existing fixed route transit services located within Precinct 2. There is, however, a need for connectivity within the region and between existing neighboring transit networks, especially as significant growth and development is expected in the region.

E. Natural and Man-made Barriers

Barriers that prevent or significantly increase the cost of constructing new roadways or expanding existing roadways. Figure III-1 shows the natural and man-made barriers in Precinct 2.

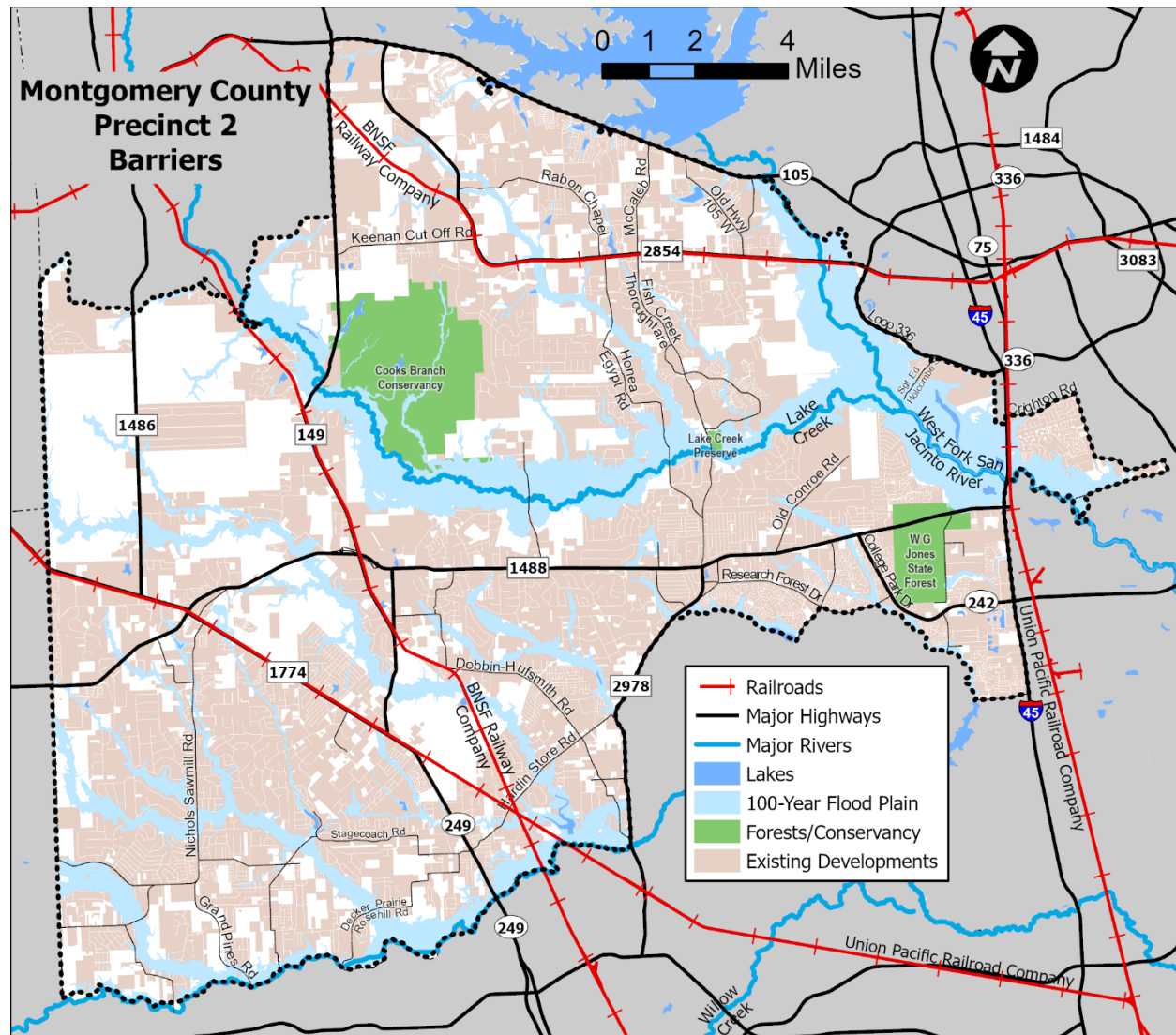


Figure III-1: Barriers

Natural barriers include major waterways such as Lake Creek and the West fork of the San Jacinto River, flood plains, and conservation areas. Conservation areas include the WG Jones State Forest, the Cooks Branch Conservancy, and the Lake Creek Preserve. It would take significant coordination with custodians of the conservation areas and greater consideration of ecological impacts to build roads through or adjacent to protected lands. Rivers and flood plain crossings are more expensive to construct, and they must be carefully designed to prevent roadway flooding.

Man-made barriers include railroads and existing developments. There are four rail lines that pass through Precinct 2 that are owned by either BNSF Railway Company or Union Pacific Railway Company. At-grade railroad crossings are undesirable from both a safety and a mobility perspective. Railroad overpasses and underpasses are costly to construct. Existing developments in

Precinct include numerous residential developments as well as commercial, medical, educational, and industrial developments. Many of the locations where it would be beneficial to add new east-west and north-south major thoroughfares already have housing subdivision that would block the proposed corridor. Many major roads that currently end with a T-intersection have a commercial development on the other side which would prevent an extension of the corridor.

F. Safety

There are several “S” curves throughout the precinct, many with small radii that require a reduction in speed. The curves can often reduce visibility of approaching vehicles and road hazards. Additional signing may be needed for some curves, and others may need realignment to improve sight distance, travel speed, and overall safety.

Drivers traveling over the speed limit is a recurring event in the precinct. Almost 40% of crashes in Precinct 2 between 2015-2019 were related to vehicles failing to control speed or traveling at an unsafe speed.

There are close to 40 at grade railroad crossings in Precinct 2. Each at grade crossing increases the risk of crashes at an intersection.

Few roads in Precinct 2 have streetlights. Almost 40% of pedestrian involved crashes occurred at night on unlit streets. Installing streetlights would improve safety, especially for pedestrians and cyclists.

About 13% of crashes in the precinct had an entrance/exit from driveway as a contributing factor, with the largest number of those on FM 1488. The lack of access management is currently an issue in the region, especially for developed areas. There is a need for access management policies such as driveway consolidation and raised medians to control how vehicles enter and exit from both private and commercial driveways.