FM150 CHARACTER PLAN

THE FM 150 WEST CHARACTER PLAN:
FINAL REPORT AND MASTER PLAN

Accepted by the
Hays County Commissioners
Court on October 10, 2017

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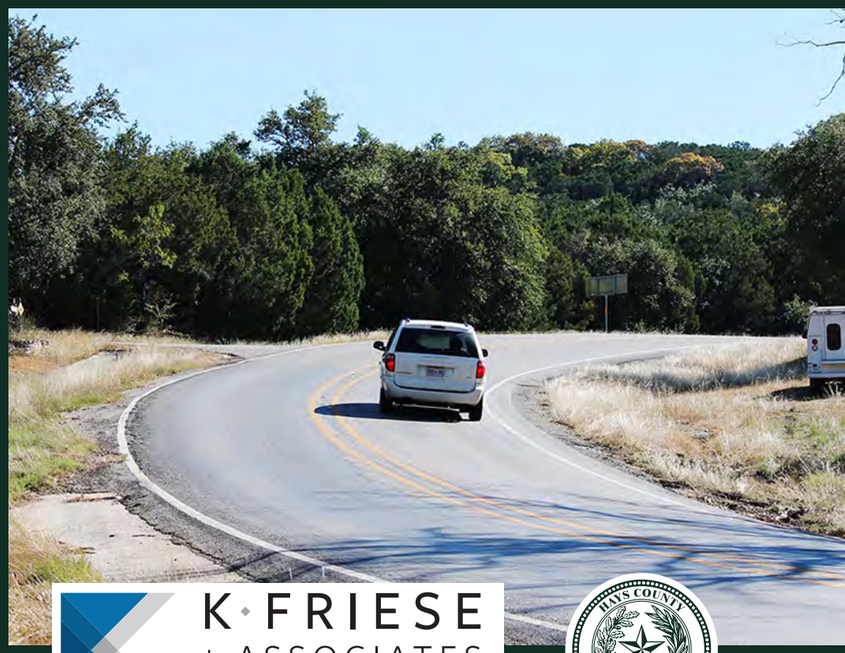

K·FRIESE + ASSOCIATES
PUBLIC PROJECT ENGINEERING

HAYS COUNTY STATE OF TEXAS

ACKNOWLEDGEMENTS

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Thank you to the Dripping Springs High School and Thurman's Mansion for providing space for meetings throughout the course of the study.

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EXECUTIVE SUMMARY

This final report documents the findings, recommendations, and suggested next steps for operating and maintaining the FM 150 corridor from Arroyo Ranch Road to RM 12. Known as the FM 150 West Master Plan, it is a "blueprint" from which future FM 150 corridor projects can be developed. The recommendations documented include near-term, high-value safety projects that could include widening shoulders, replacing guard rail, and updating signing and roadway delineation. Long-term recommendations include incremental improvements such as turn lanes, medians, elements that serve multi-modal users and a bypass around Driftwood. The goal of this project approach was to identify a right-of-way footprint that preserves the opportunity to serve forecasted regional growth while protecting the unique history, heritage, and rural, natural character of this portion of Hays County.

To do this, the Hays County Commissioners Court has taken a unique and proactive two-phase approach to develop a long-range master plan that addresses both the future form and function of FM 150. Phase I resulted in a *Corridor Features and Themes Report* that documented the nature and character of roadway elements that are to be preserved and protected, to the extent possible, while considering long range FM 150 corridor improvements. These were developed through a continued process of outreach meetings with a County-appointed Citizens Advisory Panel (CAP) and participation by local property owners and the community at large. The results of Phase I outreach formed the basis for this Phase II master plan that integrates the unique natural and developed features along the FM 150 corridor between Dripping Springs and Kyle.

This Master Plan documents a common vision for the corridor. It can be used as a reference for others who come to the area to understand there is a long-term approach to preserve the transportation integrity of FM 150 and its role in supporting Hays County residents, commerce, cultural and natural resources, and recreational users. The local community has helped define timelines of early and subsequent settlements, shared information about caves and other natural features, and revealed historic, special places that represent connections to their family roots that may otherwise have been lost. The Master Plan outlines context zones and transition areas so future development or roadway projects can be implemented while preserving the corridor and land use aesthetic qualities.

The Master Plan describes the entire corridor in segments and provides a means of considering the FM 150 corridor as a whole while reflecting the unique contexts along its path. A bypass section was identified in Phase I and a potential, conceptual route was presented in Phase II. The Master Plan notes the need for additional study of the bypass and that effort could be completed on its own while fitting within the Master Plan. The efforts in Phase II defined areas along the existing roadway where more detailed evaluations will need to occur to more clearly define alignments and roadway treatments that minimize impacts to adjacent properties.

Most importantly, this Master Plan has been developed early to provide the community time to participate in the planning process and the County time to carefully consider options. This study and the Master Plan occurred well in advance of traditional environmental evaluations. There will be opportunities and time to continue working with the community for future projects, tailored to the unique needs of each future project element.

As part of the FM 150 West plan process, Hays County integrated new and emerging methods and technical approaches to develop corridor solutions. The CAP and general public have been interested in performance-based approaches that allow the range of solutions to be adaptive and better integrated into the natural and developed environment. The CAP recommended modern roundabouts over conventional intersection forms because of their documented safety benefits and speed reduction qualities. The roundabouts also support the corridor's rural character compared to traffic signals, offer low speed attributes, and allow smaller FM 150 curves that result in fewer impact areas to the surrounding land uses.

Existing FM 150 between FM 3237 and FM 1826 was noted as especially valued because of the unique double low water crossings over Onion Creek and Driftwood community. The bypass presents an opportunity to preserve this section while meeting Hays County's long range transportation needs. Hays County and the Texas Department of Transportation (TxDOT) propose to work in partnership to advance the bypass concept and may consider jurisdictional transfers that result in the bypass section being the responsibility of TxDOT with the existing FM 150 section between FM 3237 and FM 1826 transferring to the jurisdiction of Hays County. This arrangement could result in a plan to meet long-range transportation needs while allowing county oversight of what would become the former portion of FM 150.

Incremental corridor development activities could include:

- Near-term projects to enhance the safety, performance, and reliability by widening shoulders and clearing areas next to the roadway.
- Isolated intersection projects that have independent benefits such as at Darden Hill Road or FM 3237. Projects such as these or others would follow the principles of the Master Plan.
- Future planning and environmental evaluations to better define the bypass segment alignment supporting approval activities.
- Cooperation with the local community wishing to brand the Onion Creek Valley and integrate elements and messaging along the corridor.
- Separate studies of the Elder Hill Road corridor and possible roadway corridor connections to FM 150 adjacent to the cemetery and west of RM 12.
- Coordination with TxDOT on long-range corridor development and possible jurisdictional transfer of the FM 150 segment between FM 3237 and FM 1826.

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SECTION 1 Overview and Purpose

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1 OVERVIEW AND PURPOSE

1.1 BACKGROUND

The FM 150 corridor runs from Ranch-to-Market Road (RM) 12 in Dripping Springs, through Driftwood and Kyle, to State Highway (SH) 21 east of Interstate Highway 35 (I-35). FM 150 is under TxDOT jurisdiction, which manages and maintains the roadway. Hays County is leading the FM 150 West Character Plan study, focused on the west portion of FM 150 between RM 12 in Dripping Springs and Arroyo Ranch Road at the north end of Kyle, as shown in Exhibit 1. A separate and distinct alignment study is focused on the portion from Arroyo Ranch Road heading east to I-35.

This report builds on Phase I of the study, which resulted in a *Corridor Features and Themes Report.* As described in that report, the character varies along the length of the corridor and there are several community zones, such as the FM 150 and FM 3237 intersection, the town of Driftwood, and the FM 150 and RM 12 intersection. Phase II activities better defined roadway upgrade needs on FM 1826 from FM 150 to FM 967 and on FM 967 from FM 1826 to the location of a possible bypass route connection on FM 967. During this review, existing development along FM 1826 resulted in this being identified as a community zone.

The FM 150 corridor and contributing area is valued for its natural, cultural, and historic features. The double low water crossings over Onion Creek are a significant feature for area residents and preservation is a high priority for the community. The corridor segment between FM 3237 and FM 1826 was identified in the first phase as particularly valuable to the community, with a desire not to alter this corridor segment. Therefore, a proposed bypass segment was identified and it was determined that this second phase would focus on FM 150 from Arroyo Ranch to FM 3237 and FM 150 from FM 1826 to RM 12. As shown in Exhibit 1, this phase also considers a proposed bypass segment and upgrading segments of FM 967 and FM 1826 between FM 150 and a bypass connection. Based on community input and direction, no explicit recommendations were developed for the FM 150 segment between FM 3237 and FM 1826.

This second phase builds on the foundation of the first phase to document the nature and character of the corridor and develop a master plan to guide future projects on and around the corridor. The overall purpose of this FM 150 corridor study is to plan for forecasted growth while preserving the character of the FM 150 Corridor. It is a proactive approach to begin planning for the future now.

The study goals, documented in the Phase I *Corridor Features and Themes Report,* build on the philosophy established as part of the Hays County Transportation Plan (HCTP) and embrace the concept of context sensitive solutions (CSS). CSS is a collaborative approach to develop transportation facilities in a way that considers the environmental, cultural, and historic character of the area. The vision for this portion of FM 150 must satisfy two needs: the county-wide need to provide sufficient capacity to serve forecasted growth, and the more local need to provide safe and efficient travel without compromising community character, integrity, values, and assets.

This FM 150 West Character Plan study began in October 2014 with the first phase completed in early 2016. As shown in the study schedule in Exhibit 2, the second phase kicked off in September 2016. The effort included two public meetings and seven Citizen Advisory Panel (CAP) meetings conducted nearly monthly throughout the study. The CAP includes a group of community stakeholders appointed by the Hays County Commissioner's Court for the study team to present preliminary ideas and themes to at regular progress meetings and gather valuable input throughout the duration of the study. Some CAP members also served during the first phase, which provided valued continuity in the second phase.

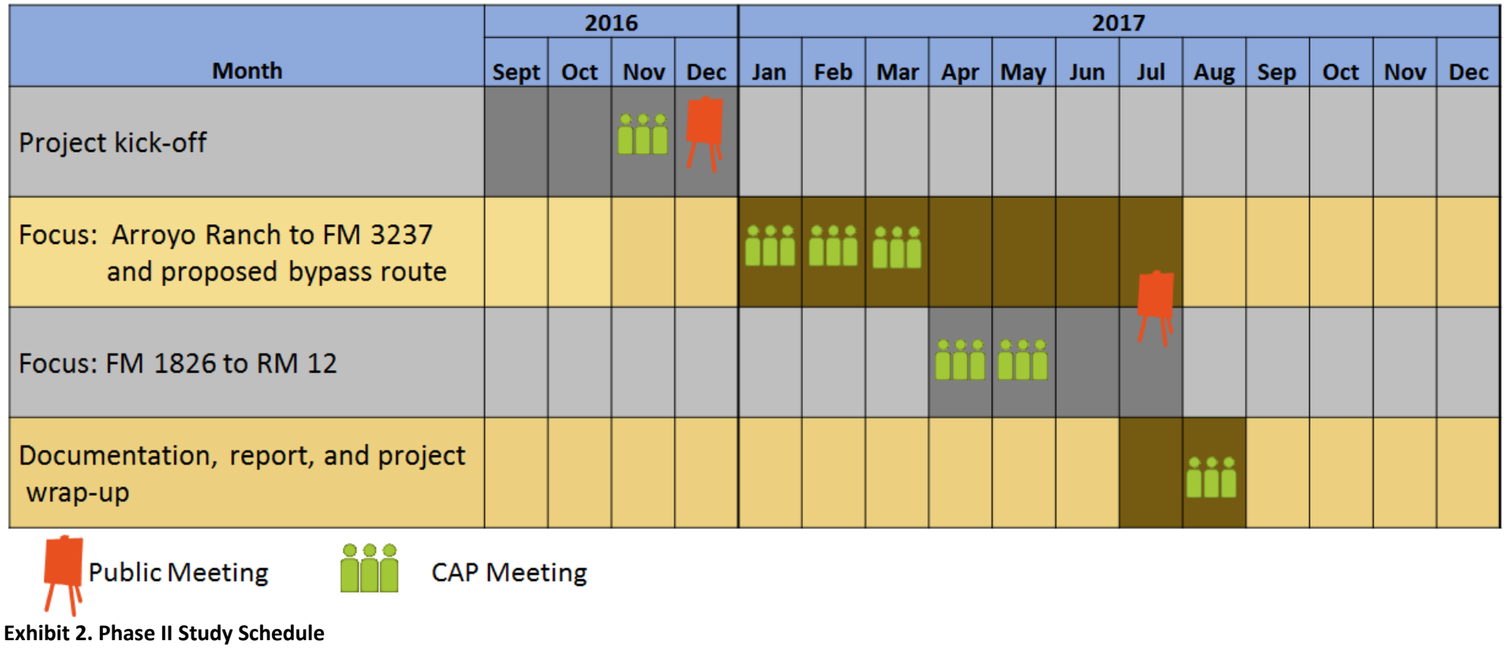
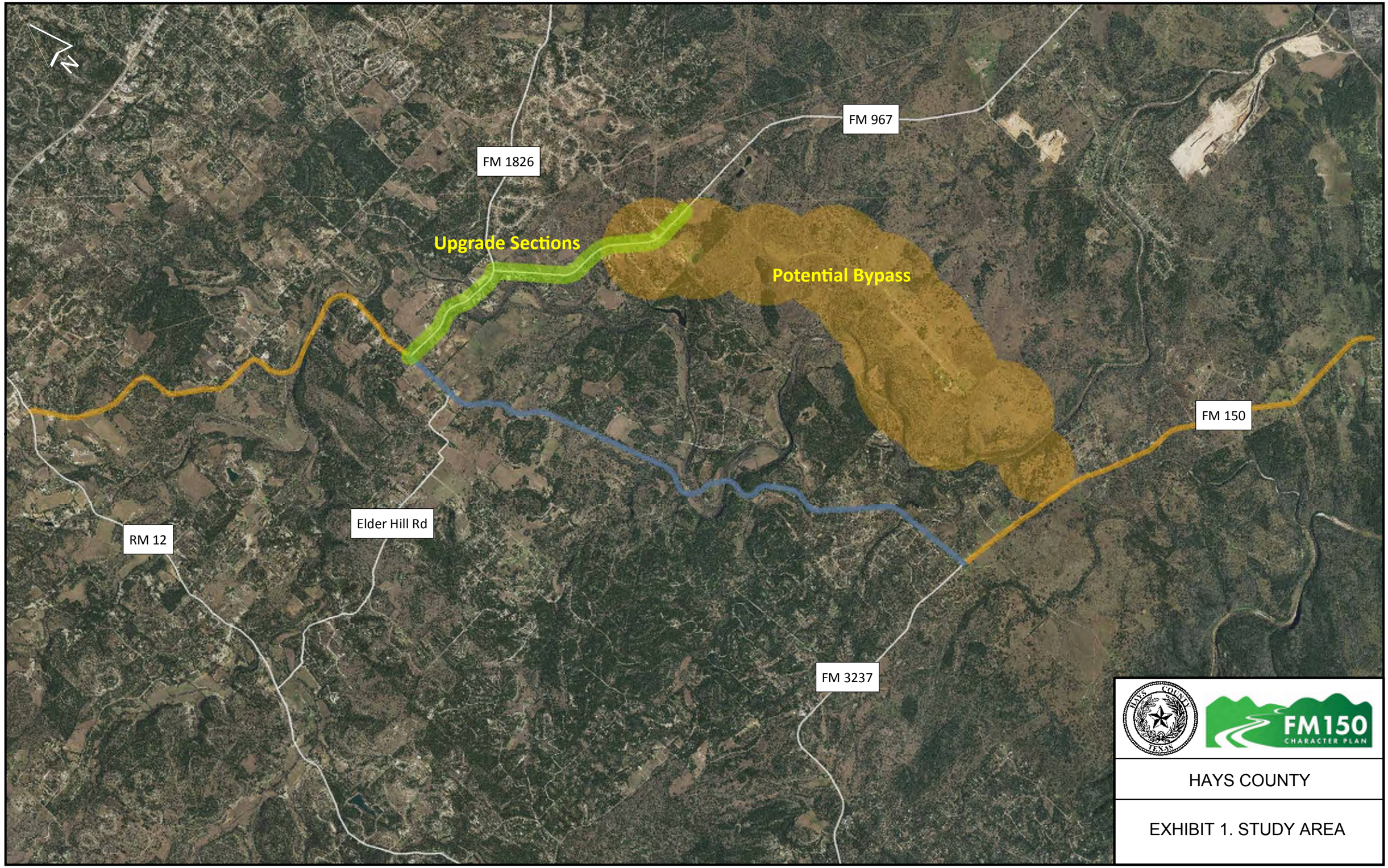


Exhibit 2. Phase II Study Schedule


N
FM 1826
FM 967
Upgrade Sections
Potential Bypass
FM 150
RM 12
Elder Hill Rd
FM 3237
HAYS COUNTY
EXHIBIT 1. STUDY AREA

The first public meeting in December 2016 provided an overview of the first phase and an opportunity to provide input on multimodal accommodations, signage, intersection alignments and forms, and target speeds for the corridor. The master plan for the corridor was presented in the second public meeting in July 2017 with an opportunity for the public to provide input on the preliminary planning alignments for the corridor sections. The final CAP meeting in August 2017 provided an opportunity for the CAP members to review feedback from the public and updates to the master plan made as a result. More details on the public involvement are provided in Section 3 of this report.

This report documents the stakeholder outreach and technical activities undertaken to develop the master plan for the corridor. The master plan defines concepts for the corridor at a preliminary planning level and helps establish priorities for future corridor projects. It builds from the foundation set by the *Corridor Features and Themes Report*, which documented existing conditions on the corridor and key characteristics. This report will help memorialize the work done in this phase and allow the findings and recommendations to be appropriately integrated in future study and design efforts.

For reference, Volume 2 of this report (provided in a separate document) includes more detailed technical documentation referenced throughout this report. Volume 3 includes reports from the two public meetings held as part of the study as well as the CAP meeting presentations and notes.

1.2 NEXT STEPS

This Final Report and Master Plan is the second and final work product from the FM 150 West Character Plan Study. It represents the culmination of an almost three year effort by the County, working with the CAP, community members, and other stakeholders, to identify a range of solutions that will be refined over time to provide for safe and efficient movement of traffic along the corridor while preserving its nature and character. Over time and as travel demand through and along the corridor increases, these solutions and concepts will move into more formal environmental reviews and design processes. During these phases and as the projects move toward and through implementation, the County will continue to work with TxDOT, the community, and other stakeholders to ensure that features and themes, context sensitive solutions, and other guiding principles identified through the planning process are respected and adhered to. More detail on next steps is presented in Section 5 of this document.

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SECTION 2 Public Involvement

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2 PUBLIC INVOLVEMENT

The Hays County Commissioners Court established that a major component of the Character Plan was working with the local communities, residents, and general public to develop a plan that reflected the community's preferences and priorities while identifying solutions for transportation needs today and in the future. Through this collaborative and transparent process, many factors were considered including the history, environmental constraints, impacts to property owners, public design preferences, safety information, and mobility needs.

Public involvement was an integral and fundamental part of this process. The County offered many opportunities to be involved including:

- Attending public meetings
- Participating in a Citizen Advisory Panel (CAP)
- Attending CAP meetings that were all open to the public
- Requesting an individual meeting (offered to anyone interested or needing additional information)
- Visiting the regularly updated website: www.improvefm150.com
- Contacting the project team or sharing input at any time via phone or email

In the Corridor Features and Themes phase from June 2014 to April 2016, the County and project team held three public meetings, 11 CAP meetings, 19 individual meetings, and received 398 comments to develop the *Corridor Features and Themes Report*. In the second phase from December 2016 to September 2017, the County and project team held two public meetings, seven CAP meetings, individual meetings as requested by stakeholders, and received 138 comments.

Highlights of the public involvement process include:

- Identification and modification of the Context Zones
- Inclusion of a bypass around Driftwood
- Development of different intersection treatments, such as roundabouts, to preserve character while enhancing mobility
- Adjustments of conceptual improvements to preserve and enhance different community resources

The Commissioners Court recognized that the challenging decisions needed to keep travel along FM 150 safe and efficient considering current use and growth projections, while preserving the character of the community, required planning ahead to work alongside the public in identifying solutions. The total engagement from the successful outreach program is noted in Exhibit 3.

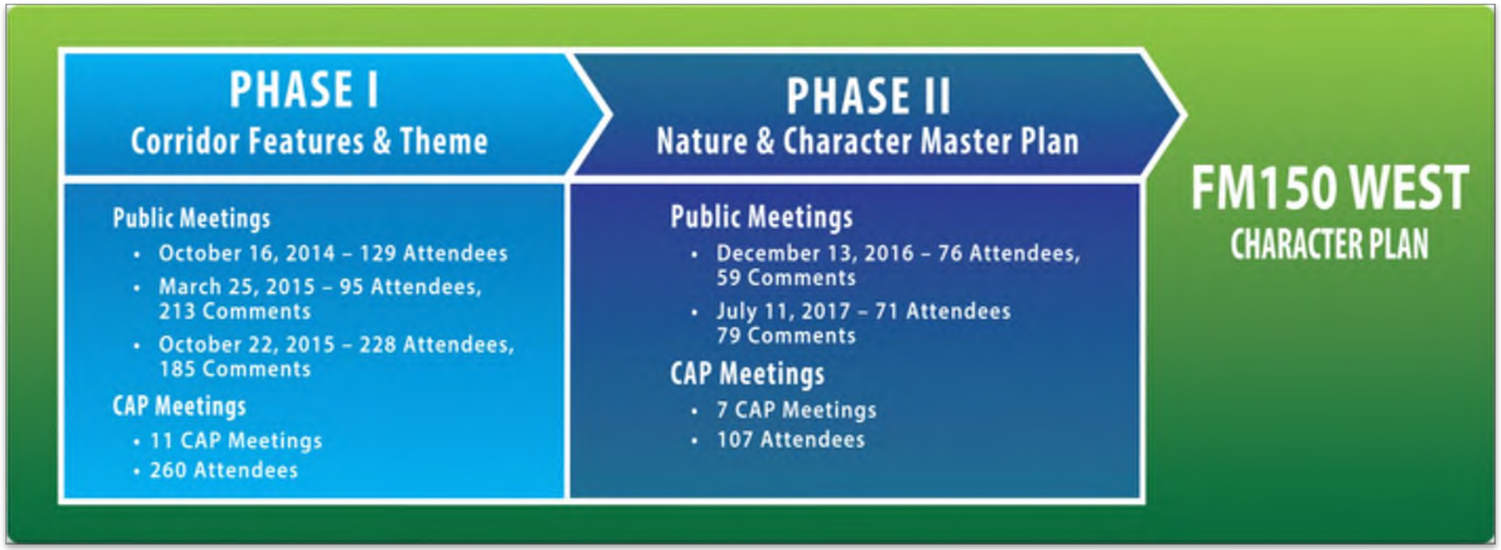

Exhibit 3. Public Involvement Overview

2.1 CITIZEN ADVISORY PANEL ACTIVITIES

A CAP was established to represent corridor stakeholders and work alongside the County and project team in the development of the FM 150 Character Plan. The CAP was selected and appointed by Precinct 3 Commissioner Will Conley and Precinct 4 Commissioner Ray Whisenant. The CAP was made up of 11 members and met 11 times in the Corridor Features and Themes phase. The CAP was made up of nine members and met seven times in the second phase. Highlights of CAP activities and contributions in the second phase include:

Highlights:

- Identification of Heritage Ranches and developing alternatives to protect these locations.
- Adjusting alignments of improvements to preserve unique community resources and conservation easement lands.
- Input on cross-sections for corridor and upgrade sections. Exhibit 4 illustrates comments received from the CAP and members of the public in the January 2017 CAP meeting on the upgrade sections.

Table 1 provides a summary of each CAP meeting. Exhibits 5 through 7 provide images from some of the CAP meetings, illustrating discussions and collaboration between the CAP members and project team.

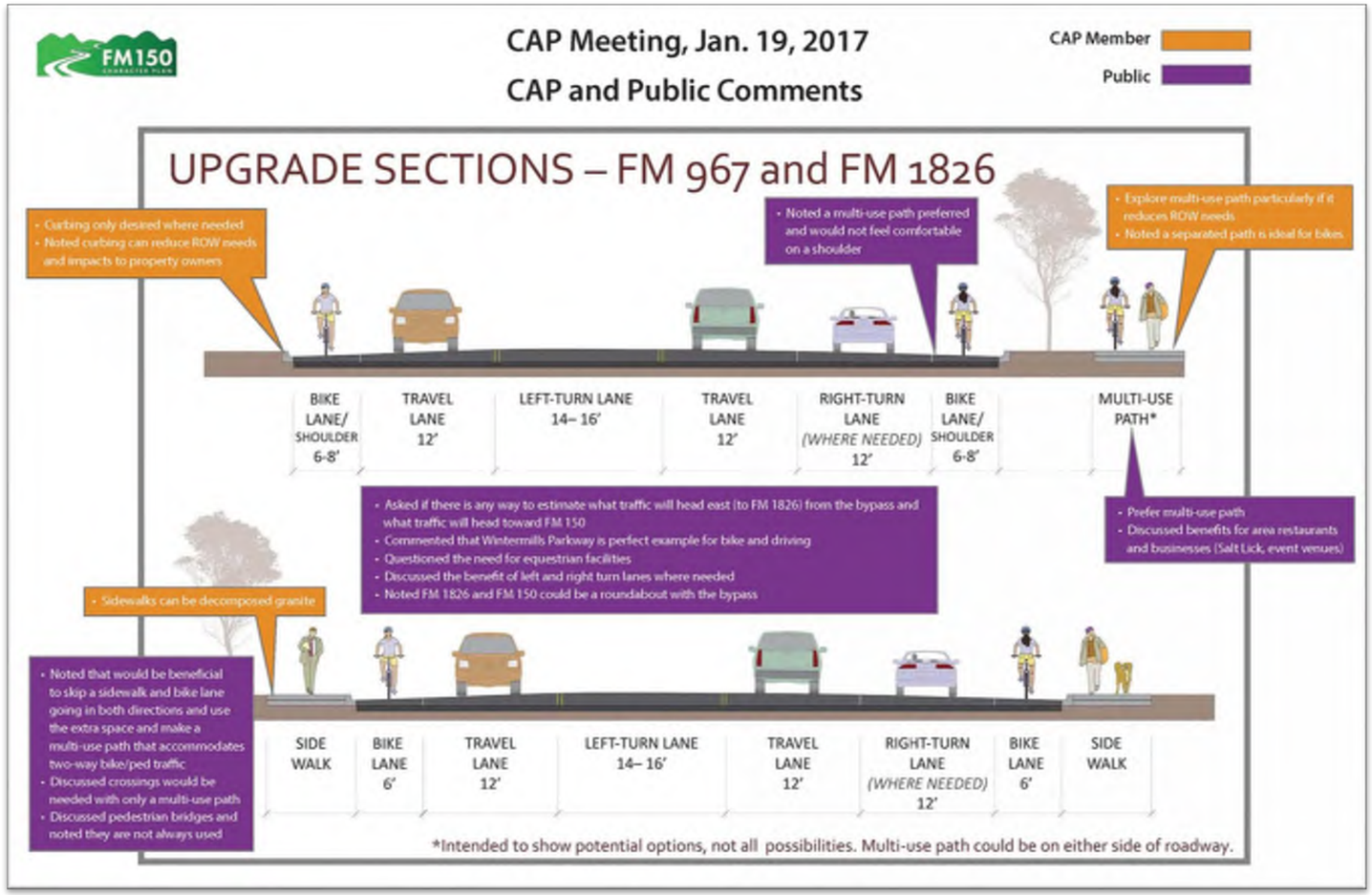

Exhibit 4. CAP Meeting – January 2017

Comments received during interactive activity with the CAP and members of the public

Table 1: CAP Meeting Summary – Phase II

Meeting Date	No. of Attendees	Meeting Purpose
November 15, 2016	5 CAP members and 4 Public members	Introductory meeting to provide overview of the study and schedule, and review plans for the December public meeting, and participate in a mapping exercise
January 19, 2017	4 CAP members and 8 Public members	Overview of December public meeting and input received; and considerations for the FM 150 from Arroyo Ranch to FM 3237 and the Bypass sections
February 23, 2017	4 CAP members and 6 Public members	Review of draft concepts for Bypass connections to FM 150 and FM 967, and upgrade sections of FM 967 and FM 1826
March 23, 2017	5 CAP members and 17 Public members	Review of draft concepts for FM 150 from Arroyo Ranch to FM 3237, Bypass, and upgrade sections, and discussion for the FM 1826 to RM 12 section
April 27, 2017	7 CAP members and 17 Public members	Review of draft concepts for FM 150 from FM 1826 to RM 12 and presentation from the City of Austin Wildland Conservation Division on the City of Austin's Water Quality Protection mission and lands in Hays County
May 18, 2017	3 CAP members and 14 Public members	Review of concepts for the Darden Hill area, and FM 150 from RM 12 to FM 1826 and review of plans for the July public meeting
August 8, 2017	5 CAP members and 32 Public members	Overview of July public meeting and input received and a wrap up of Phase II

Exhibit 5. CAP Meeting – March 2017

Exhibit 6. CAP Meeting – March 2017

Exhibit 7. CAP Meeting – August 2017

2.2 PUBLIC MEETINGS

Hays County hosted two public meetings during Phase II at Dripping Springs High School. These meetings served as opportunities to meet with community members, share study information and collect input. Feedback and input were collected from the community through mapping exercises, comment cards and extensive discussions with study team members.

December 2016

The purpose of this meeting was to review the highlights of the *Corridor Features and Themes Report*, share information on the second phase of the project, and collect input on various roadway elements (multimodal options, intersections and speeds) and aesthetic features to be considered as concepts are further defined.

July 2017

The purpose of this meeting was to share background information on the study process and conceptual designs, and collect input for the:

- North Section: FM 150 from FM 1826 to RM 12
- South Section: FM 150 from Arroyo Ranch Road to FM 3237
- Proposed alignment for the bypass
- Upgrade sections of FM 967 and FM 1826

Exhibit 8 illustrates concepts shared at the July 2017 Public Meeting on the North Section. Exhibits 9 and 10 show public members providing comments on maps at each public meeting.

Volume 3 includes reports from the two public meetings.

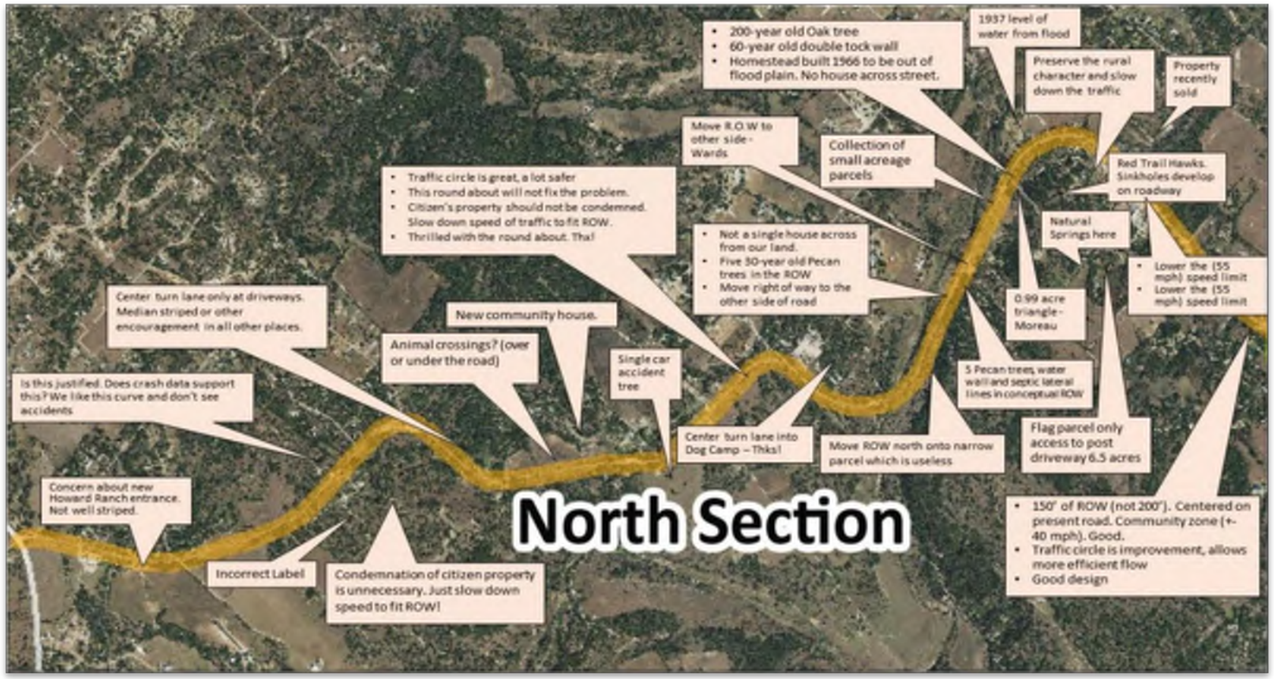

Exhibit 8. Public Meeting – July 2017

Snap shot of some mapped comments received at the meeting

Exhibit 9. Public Meeting – December 2016

Exhibit 10. Public Meeting – July 2017

2.3 ADDITIONAL MEETINGS

Throughout the course of Phase II, the study team met with local jurisdictions, property owners, and citizens who requested individual meetings. Summaries of these meetings are provided in Table 2. The purpose of these meetings was to share study information and details while collecting input and addressing individual concerns. The study team and Hays County officials met with jurisdictional representatives, property owners, and stakeholders in separate meetings to discuss potential options and provide updates.

2.4 ADDITIONAL INPUT RECEIVED

The Driftwood Historical Conservation Society (DHCS) conducted a survey and shared the results to be documented in the study. The survey included 91 comments and noted a need for improved intersection treatments, slower speeds, and a desire to keep the rural character of the County. The survey results are provided in Section 1 of Volume 2. The DHCS provided additional information from its low water crossing team and Roads Advisory Group, provided in Section 2 of Volume 2.

Table 2: FM 150 West Character Plan Stakeholder Meetings

Stakeholder – References	Meeting Details	Summary
Mike Rutherford Jr. – Property owner along FM 150	January 6, 2017	Meeting to discuss the status of the study and the potential bypass route
Travis and Tamara Tindall, Travis and Vicky Cox - Property owners along FM 150	February 3, 2017	Meeting to discuss the intersection of FM 150 and FM 3237 in Hays City
Sherri Kuhl and Kevin Thuesen – City of Austin Water Utility, Wildland Conservation Division at Reicher Ranch	February 9, 2017	Meeting to discuss the City of Austin's Water Quality Protection lands in Hays County and the potential bypass alignment and termini
Travis and Tamara Tindall, Travis and Vicky Cox - Property owners along FM 150	March 30, 2017	Meeting to discuss the potential bypass route and conceptual alignments
Mike Rutherford Jr. – Property owner along FM 150	May 12, 2017	Meeting to discuss the intersection of FM 150 and RM 12
City of Dripping Springs	August 4, 2017	Meeting to provide a status update on the project
George Cofer - Hill Country Conservancy	August 16, 2017	Meeting to discuss the status of the study and the potential bypass route

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SECTION 3 Existing Conditions Updates

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3 EXISTING CONDITIONS UPDATE

A comprehensive assessment of existing conditions was conducted in Phase I of the study. A second assessment was conducted in Phase II to compare data, assess any changes, and provide more information. Traffic counts were conducted in December 2014 and again in November-December 2016 and January 2017. Crash data was collected and analyzed for January 2010 through June 2014 and subsequently for July 2014 to August 2016 was assessed. Environmental constraints were also updated in the second phase. The assessments compared the results of the Phase I analysis for the following:

- Intersection volumes and operations
- Roadway volumes
- Crash history
- Environmental constraints

The following sub-sections describe the results of this assessment.

3.1 INTERSECTION VOLUMES AND OPERATIONS

The study team collected data at key intersections on FM 150 and the surrounding roadways to assess intersection capacity and identify critical movements during the peak hours. The five stop-controlled intersections on the corridor and the FM 1826/FM 967 intersection were assessed based on delay, volume-to-capacity ratio, and level of service (LOS). At stop-controlled intersections, the critical movement is used to describe operations. The critical movement is commonly a minor-street left-turn.

Exhibit 11 illustrates the total entering vehicles at each study intersection during the AM and PM peak hours. The comparison of peak hour intersection counts collected on FM 150 to those previously collected in 2014 showed AM peak hour volumes increased on average by about 31% and PM peak hour volumes increased on average by about 24%.

Exhibit 12 illustrates study intersection operations during the weekday AM and PM peak hours. As seen in the exhibit, the critical movement at all study intersections operates at a LOS C or better during the AM peak hour. During the PM peak hour, three intersections have a critical movement with a delay over 25 seconds, indicated by a LOS D or worse. These intersections include:

- **FM 150/RM 12:** the westbound left-turn from FM 150 to RM 12 operates at a delay just over 50 seconds during the PM peak hour, equating to a LOS F. Approximately 20 vehicles were counted making this movement.
- **FM 150/FM 1826:** the westbound left-turn from FM 1826 to FM 150 operates at a delay of nearly 40 seconds during the PM peak hour, equating to a LOS E. Approximately 285 vehicles were counted making this movement.
- **FM 1826/FM 967:** the northbound left-turn from FM 967 to FM 1826 operates at a delay of 50 seconds during the PM peak hour, equating to a LOS F. Approximately 150 vehicles were counted making this movement.

The intersection turning movement counts and output sheets from the intersection assessment are provided in Section 3 of Volume 2.

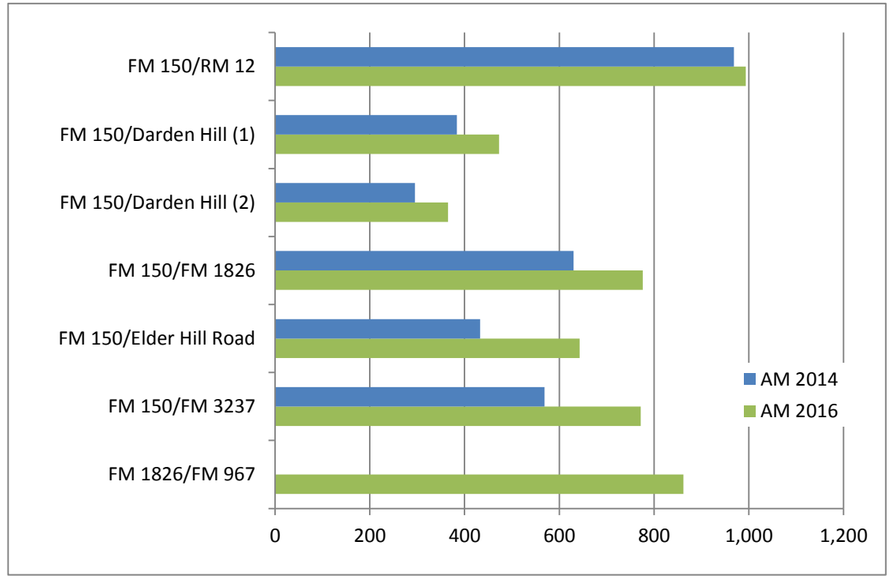
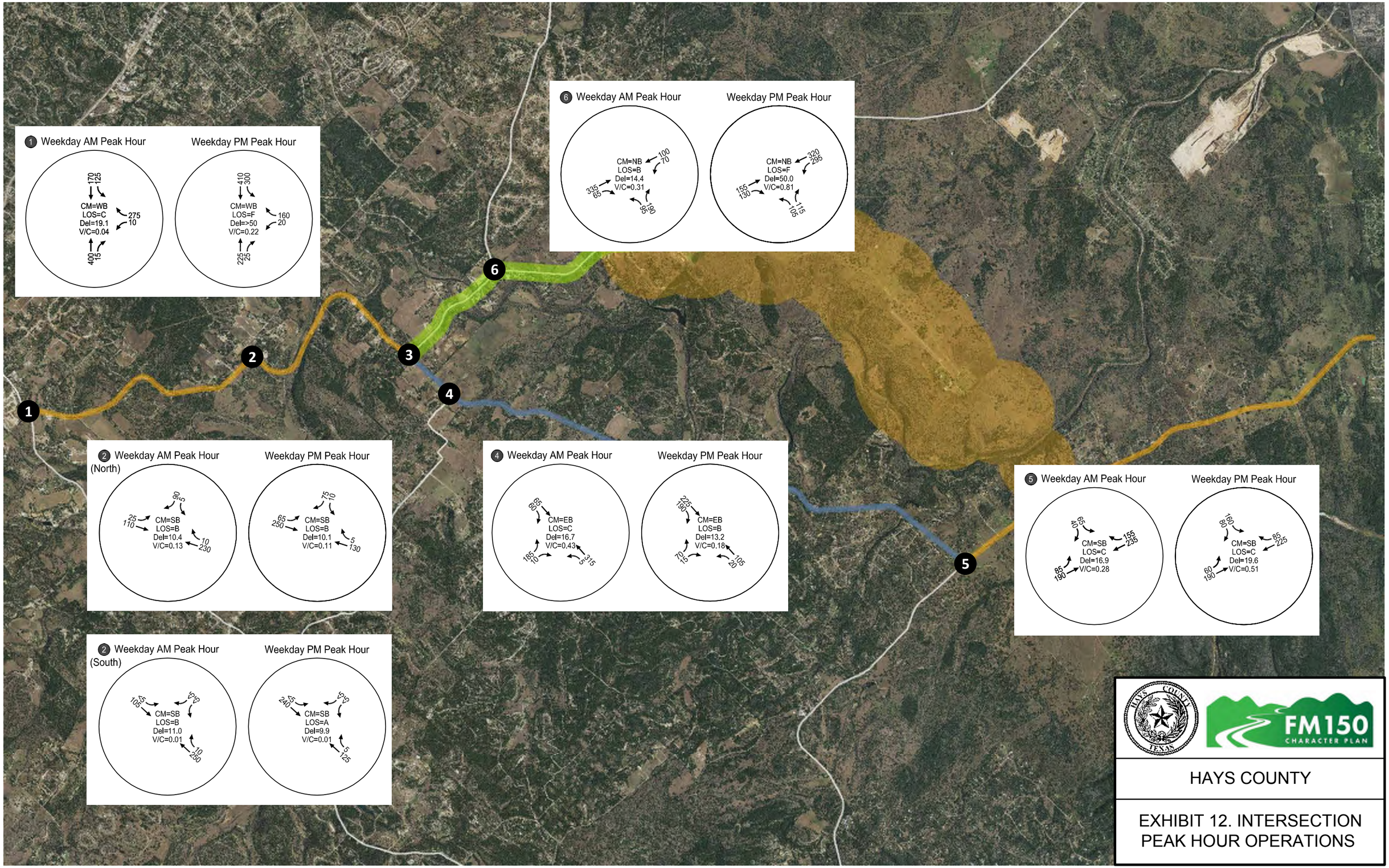


Exhibit 11. Peak Hour Total Entering Vehicles at Study Intersections


1 Weekday AM Peak Hour
CM=WB
LOS=C
Del=19.1
V/C=0.04
170
125
275
10
400
15
Weekday PM Peak Hour
CM=WB
LOS=F
Del=>50
V/C=0.22
410
300
160
20
225
25
6 Weekday AM Peak Hour
CM=NB
LOS=B
Del=14.4
V/C=0.31
100
70
335
65
95
190
Weekday PM Peak Hour
CM=NB
LOS=F
Del=50.0
V/C=0.81
320
295
155
130
115
105
2 Weekday AM Peak Hour
(North)
CM=SB
LOS=B
Del=10.4
V/C=0.13
90
25
110
10
230
Weekday PM Peak Hour
CM=SB
LOS=B
Del=10.1
V/C=0.11
75
10
65
250
5
130
4 Weekday AM Peak Hour
CM=EB
LOS=C
Del=16.7
V/C=0.43
65
60
185
10
315
Weekday PM Peak Hour
CM=EB
LOS=B
Del=13.2
V/C=0.18
225
190
70
15
105
20
5 Weekday AM Peak Hour
CM=SB
LOS=C
Del=16.9
V/C=0.28
65
40
155
235
85
190
Weekday PM Peak Hour
CM=SB
LOS=C
Del=19.6
V/C=0.51
160
80
85
225
60
190
2 Weekday AM Peak Hour
(South)
CM=SB
LOS=B
Del=11.0
V/C=0.01
45
105
10
250
Weekday PM Peak Hour
CM=SB
LOS=A
Del=9.9
V/C=0.01
45
240
5
125
1
2
3
4
5
6
HAYS COUNTY
TEXAS
FM150
CHARACTER PLAN
HAYS COUNTY
EXHIBIT 12. INTERSECTION PEAK HOUR OPERATIONS

3.2 ROADWAY VOLUMES

Roadway volume data was collected with four tube counters at locations on the FM 150 corridor and seven on surrounding roadways for one weekday in late November 2016. The data was used to assess travel patterns at the different locations for different times of day. Due to technical difficulties with the tube counter on FM 150 near the Onion Creek Crossings, data could not be recorded. In addition to collecting traffic volumes, heavy vehicle percentages were also recorded at each location. The counts collected are provided in Section 4 of Volume 2.

The study team compared the data collected on FM 150 to the data previously collected in 2014, with the comparison shown in Exhibit 13. As seen in the exhibit, total daily volumes increased at the three locations of FM 150 counted in both 2014 and 2016 from 2% to 7%. This increase is significantly less than that observed during the weekday AM and PM peak hours. This suggests that while volumes are increasing significantly during the morning and evening peak hours, volumes are not increasing as significantly during the other hours of the day. Exhibits 14 through 16 show the hourly tube count volumes collected on FM 150 and in the study area by direction.

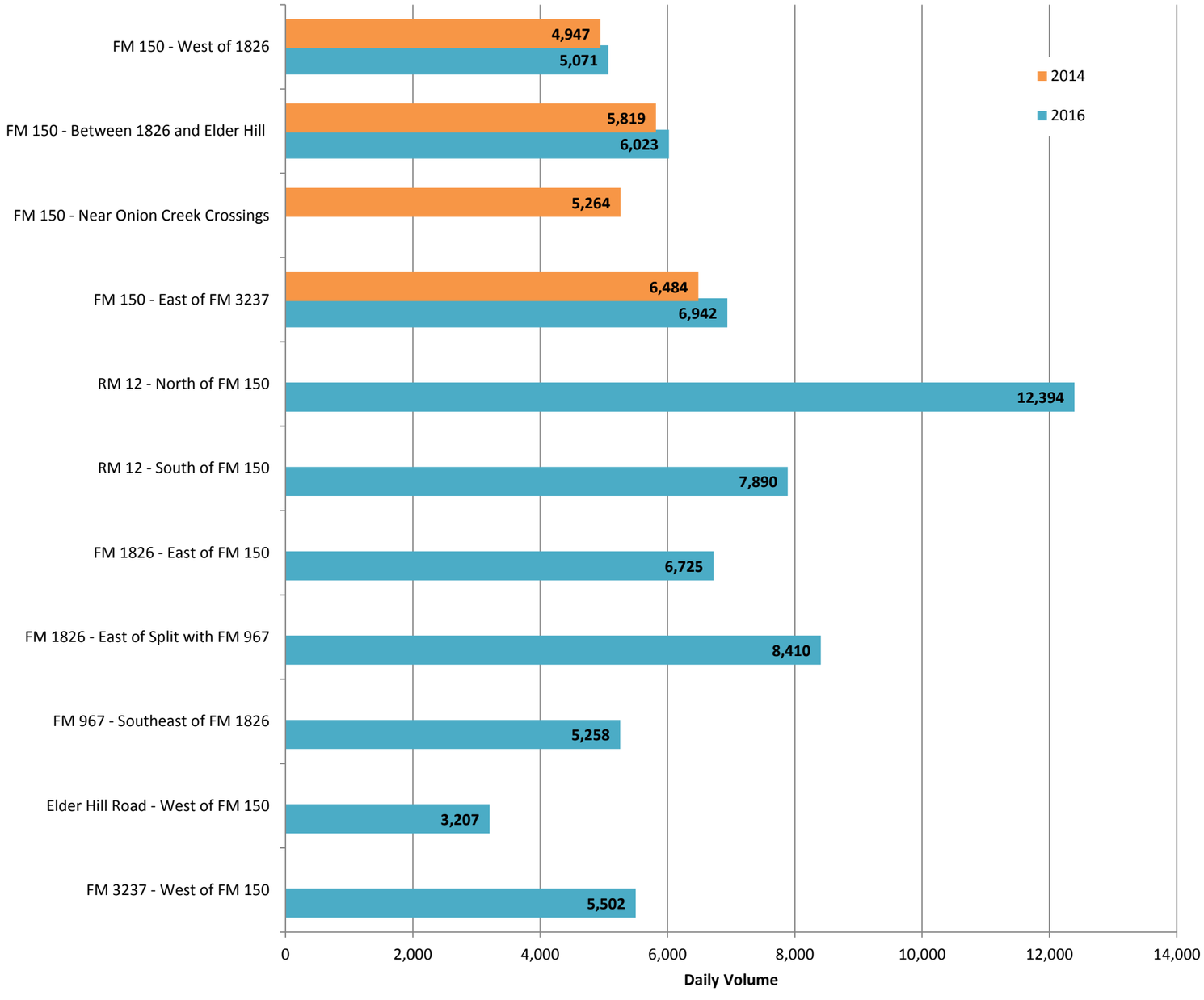
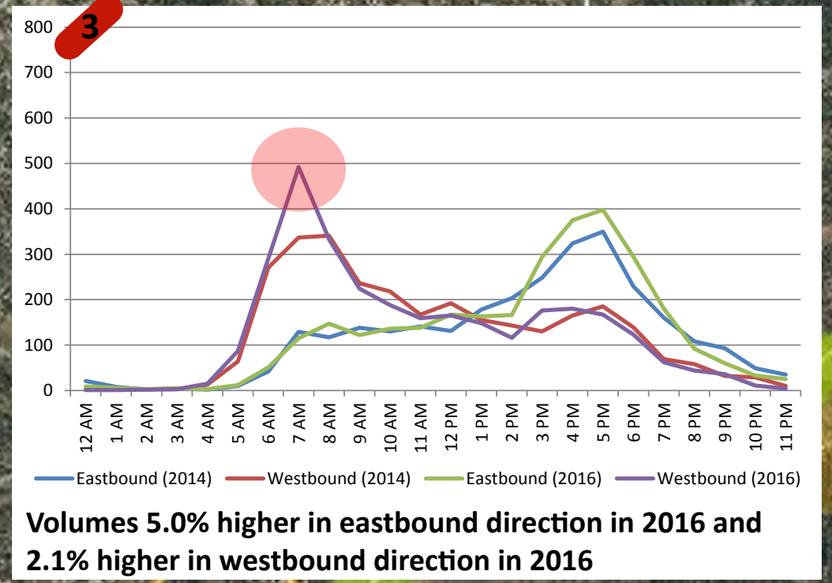


Exhibit 13. Daily Volume at Study Roadways

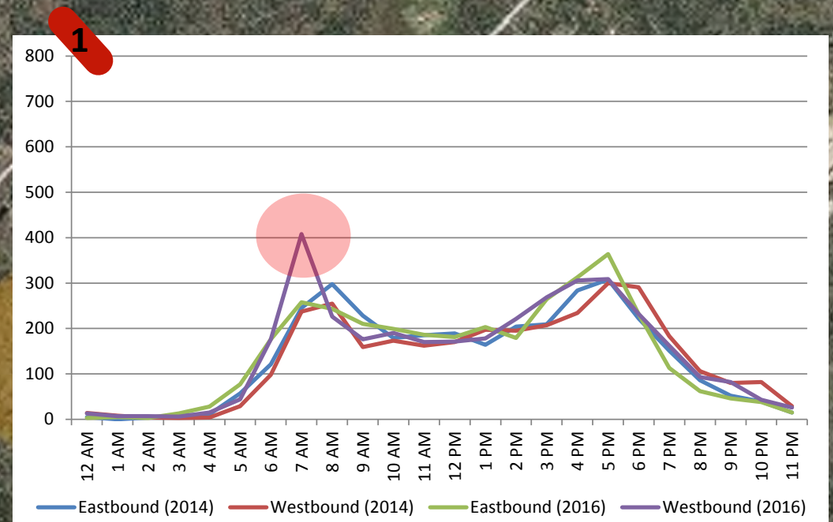
290

RM 12

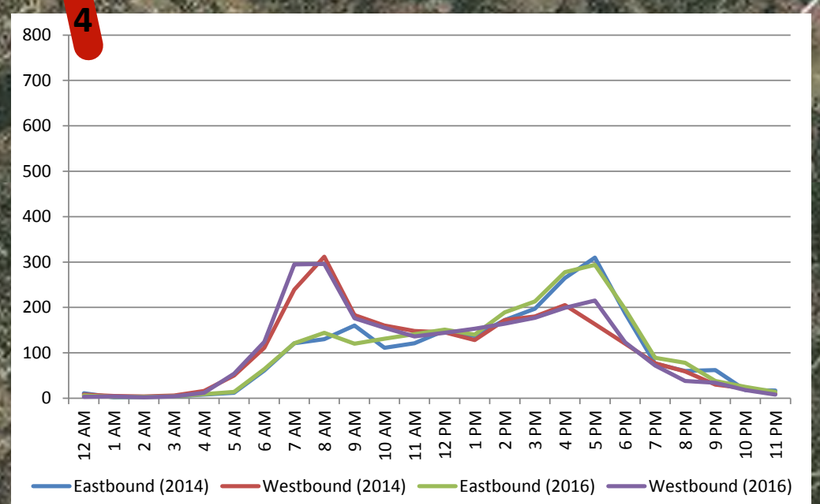
FM 150



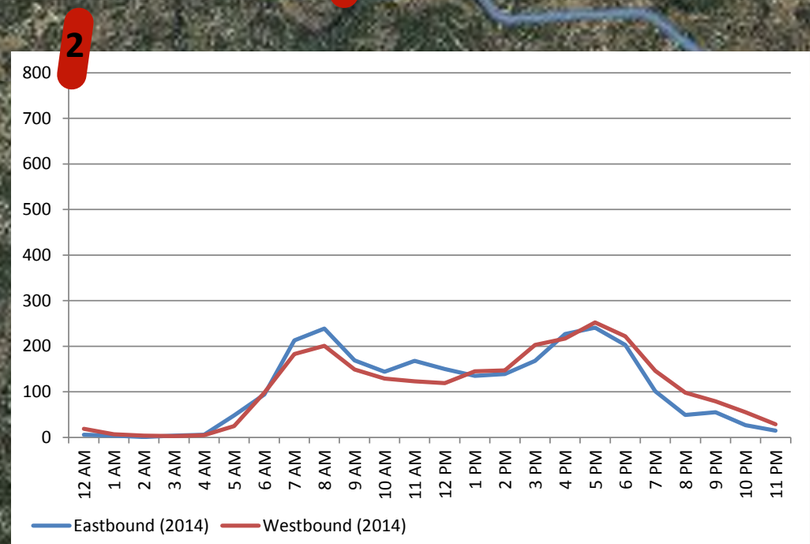
Volumes 5.0% higher in eastbound direction in 2016 and 2.1% higher in westbound direction in 2016



Volumes 4.5% higher in eastbound direction in 2016 and 9.6% higher in westbound direction in 2016



Volumes 3.0% higher in eastbound direction in 2016 and 2.1% higher in westbound direction in 2016



Error in 2016 data, 2014 data shown

HAYS COUNTY

EXHIBIT 14. TUBE COUNTS 1-4
FM 150 CORRIDOR

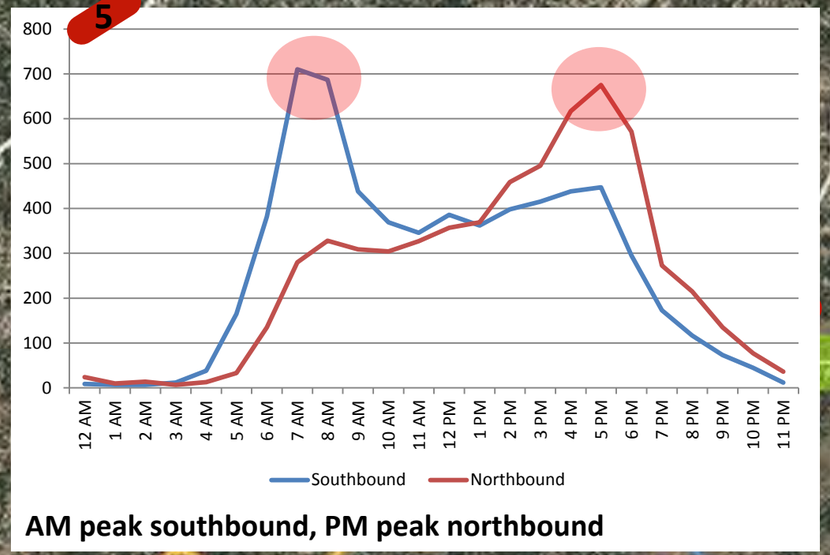
FM 1826

FM 967

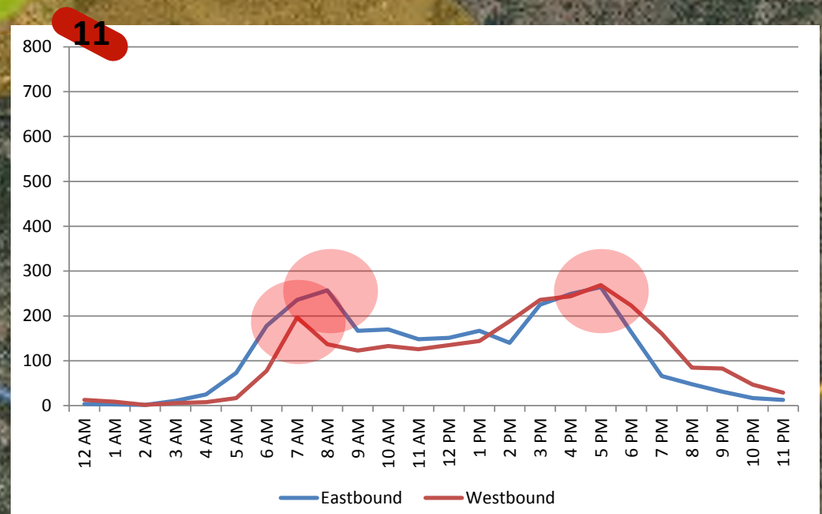
FM 150

RM 12

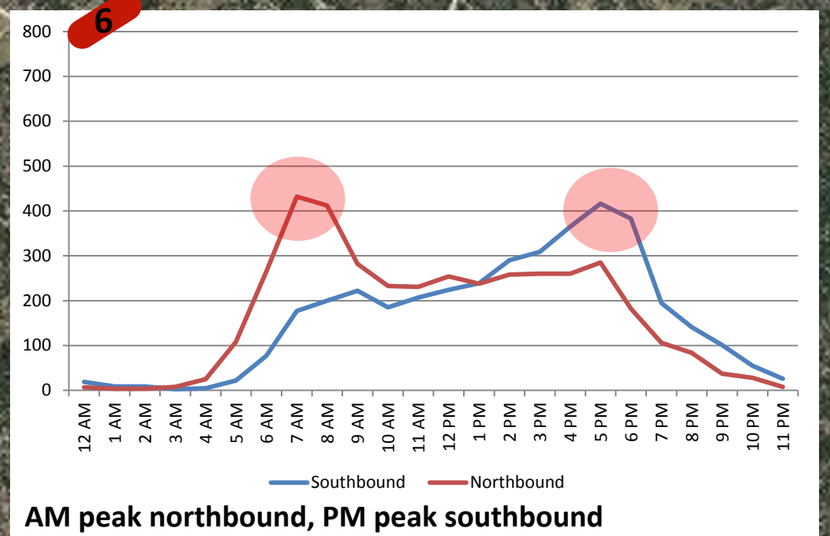
FM 3237



AM peak southbound, PM peak northbound



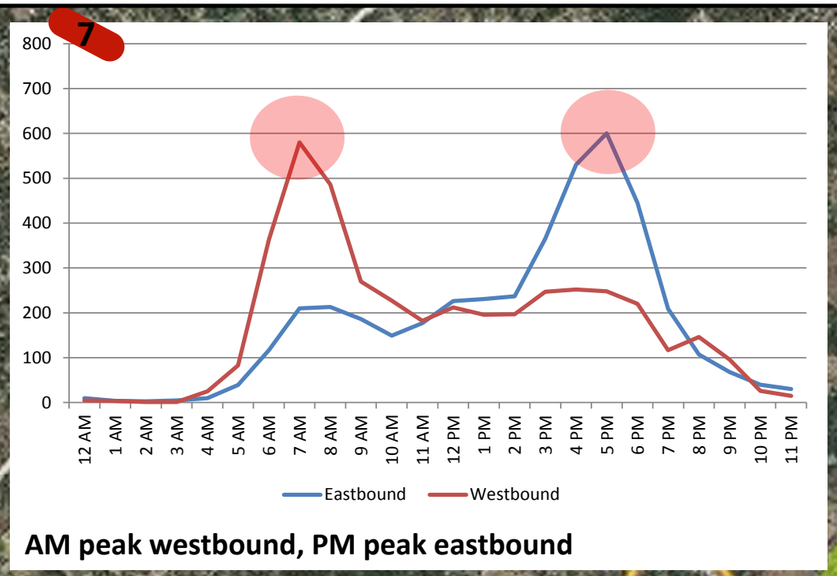
Peaks in both direction in AM and PM



AM peak northbound, PM peak southbound

HAYS COUNTY

EXHIBIT 15. TUBE COUNTS 5,6,11
FM 150 STUDY AREA



AM peak westbound, PM peak eastbound

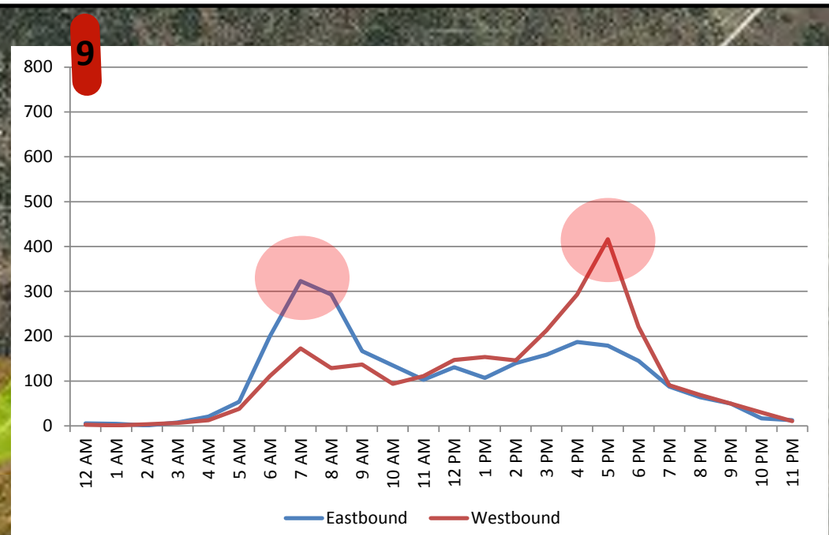
FM 1826

7

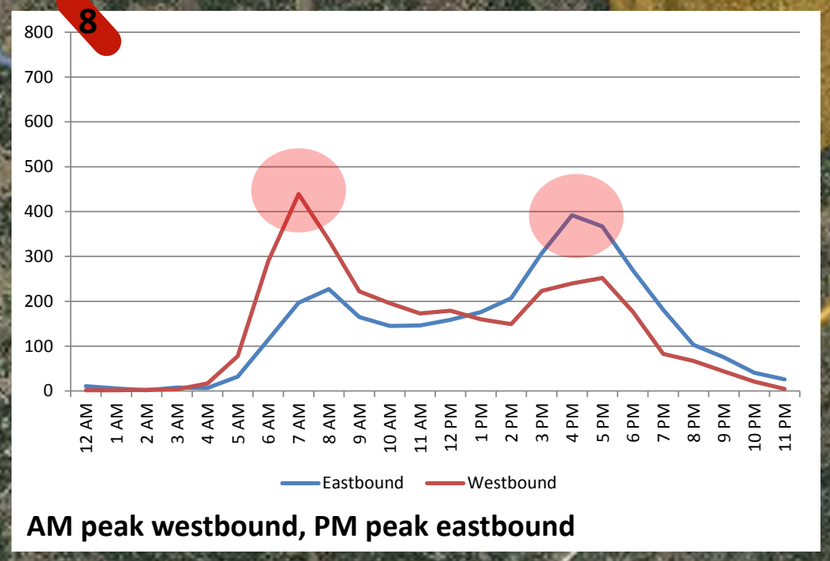
9

FM 967

8



AM peak eastbound, PM peak westbound
Volumes lower than on FM 967 west of FM 1826

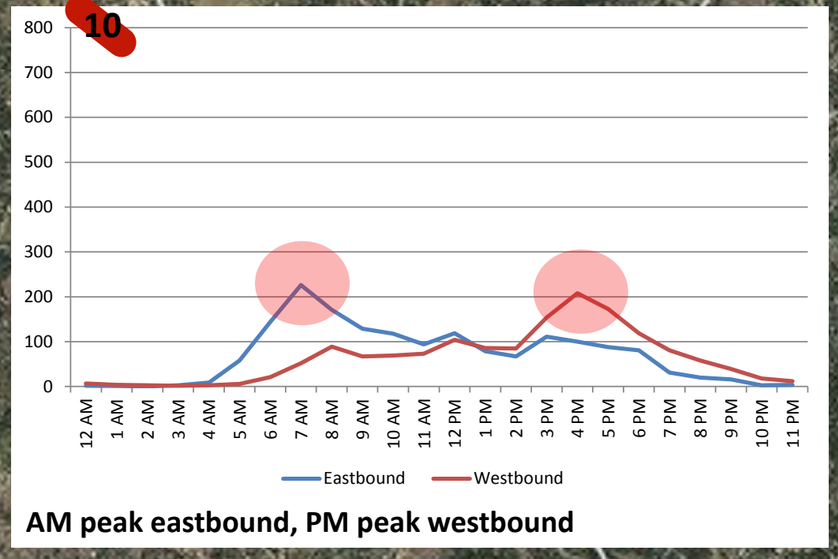


AM peak westbound, PM peak eastbound

FM 150

RM 12

10



AM peak eastbound, PM peak westbound

FM 3237

HAYS COUNTY

EXHIBIT 16. TUBE COUNTS 7-10
FM 150 STUDY AREA

3.3 CRASH HISTORY

Crash data from January 2010 through June 2014 was assessed for the FM 150 corridor as part of Phase I. The summary of this data is documented in Section 5 of the *Corridor Features and Themes Report*. As part of Phase II, the study team reviewed updated crash data to assess any changes or new trends from July 2014 to August 2016. The key purposes of assessing the crash data are to identify:

- Crash trends (i.e., crash severity, type, location, time of day)
- Crash trends potentially attributed to the roadway geometry
- Focus areas with higher crash frequencies/severities

In total, 44 crashes were reported on the corridor between July 2014 and August 2016, representing an average of about 19.6 crashes per year, which is similar to that for the data assessed in Phase I. The majority of the reported crashes involved no injuries or possible injuries, with 1 additional fatal crash near the double low water crossings reported.

The graphs in Exhibit 17 and Exhibit 18 show the crashes by type versus severity and by location versus severity, respectively. The trends from the crash data are similar to that from Phase I, with similar conclusions. A signification portion of the crashes were fixed object crashes and the majority were not intersection related and occurred when the weather was clear. This suggests the potential influence of narrow shoulders, isolated or tight curves, and non-recoverable sections of roadway.

Exhibit 19 maps all the reported crashes by type and Exhibit 20 maps all the crashes by severity. A copy of the crash data is provided in Section 5 of Volume 2.

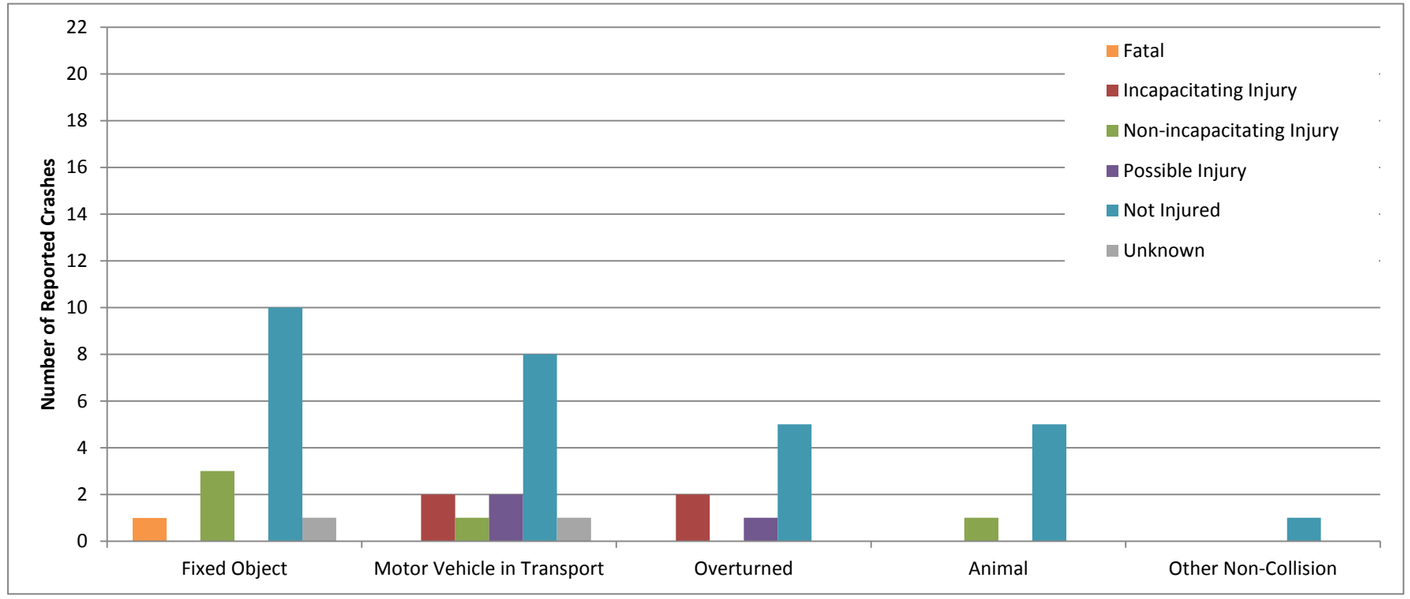


Exhibit 17. Crashes by Type versus Severity

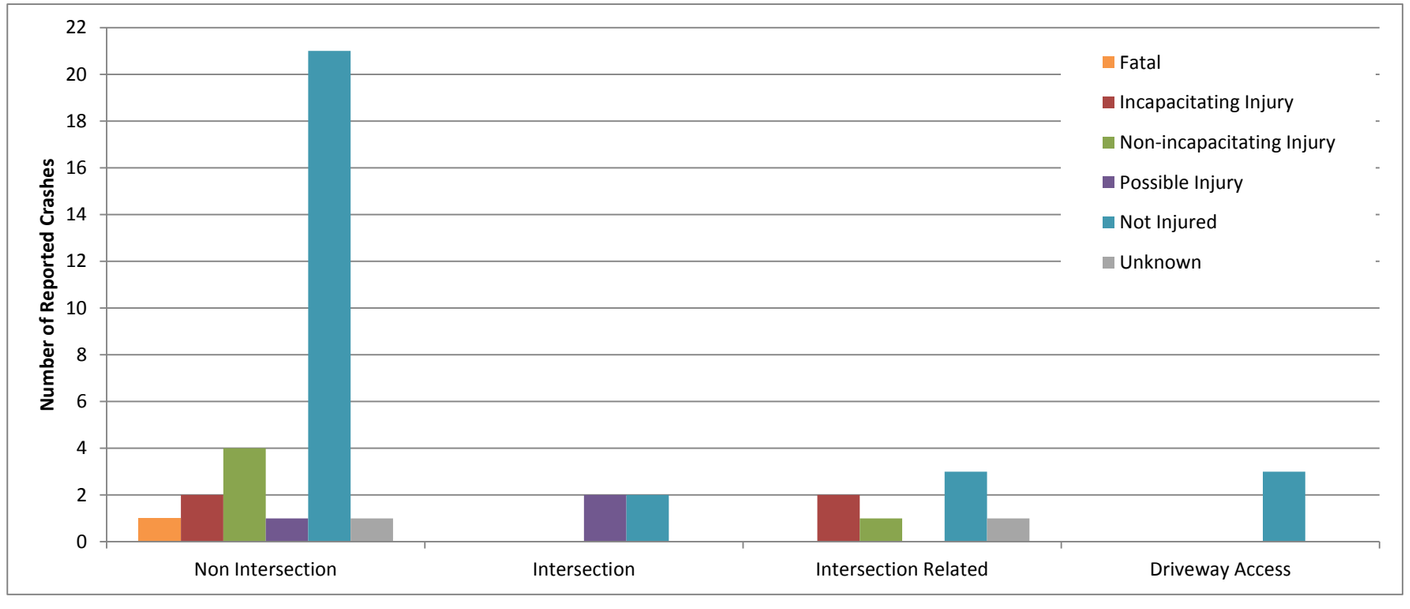
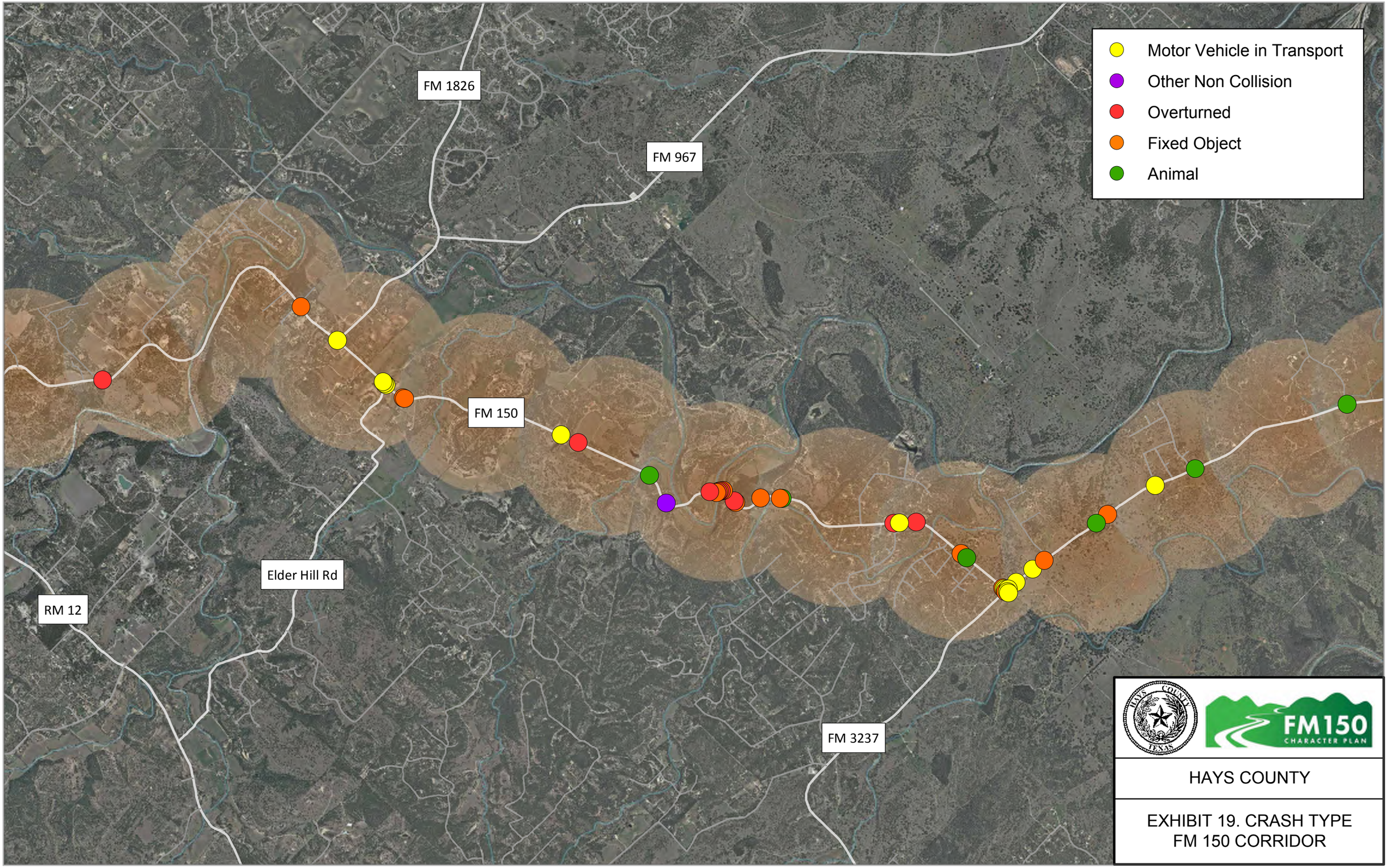
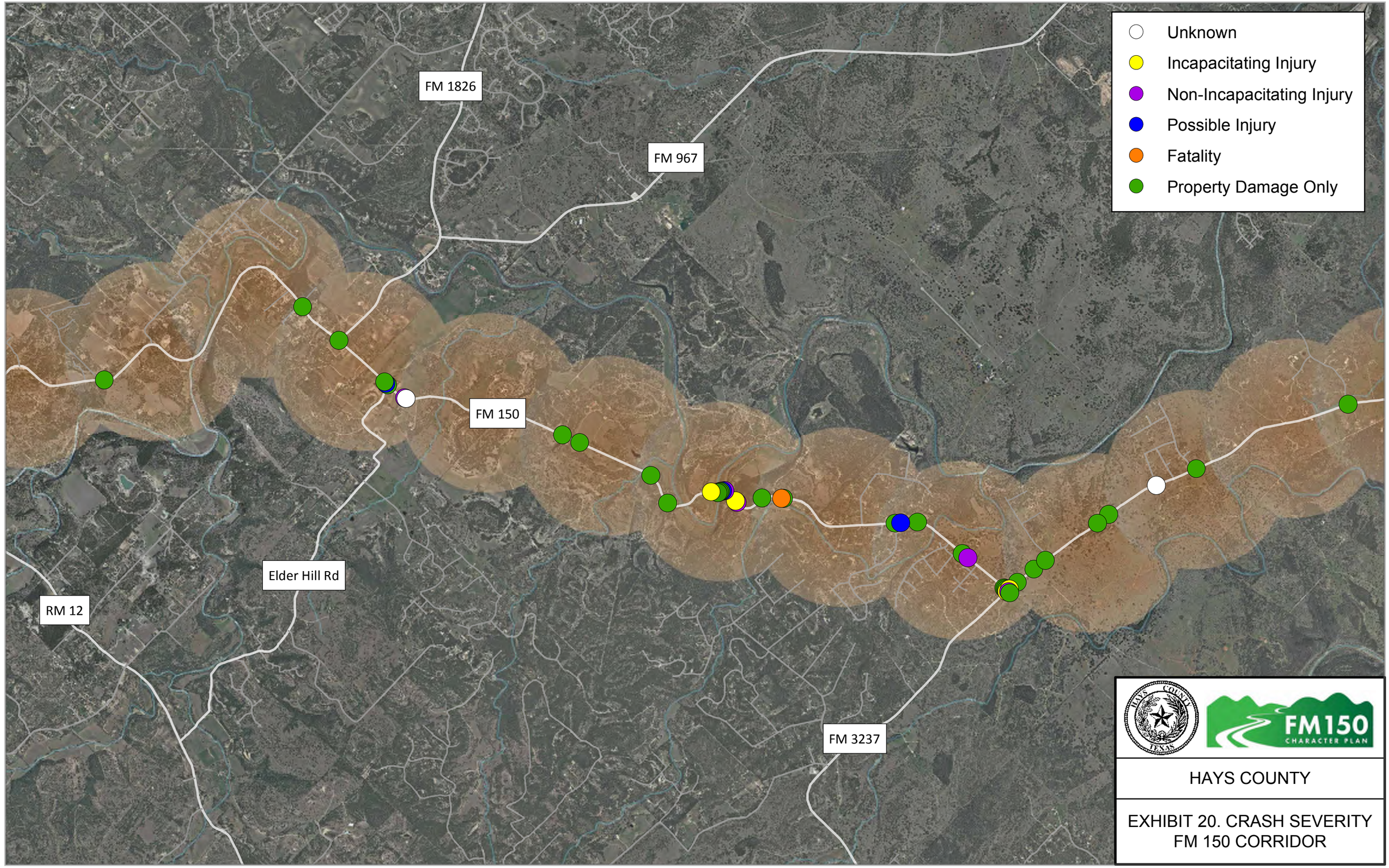


Exhibit 18. Crashes by Location versus Severity



HAYS COUNTY

EXHIBIT 19. CRASH TYPE
FM 150 CORRIDOR



HAYS COUNTY

EXHIBIT 20. CRASH SEVERITY
FM 150 CORRIDOR

3.4 ENVIRONMENTAL CONSTRAINTS

From the outset, this project was intended to provide information to be integrated into later projects that would meet any needed requirements or processes in the National Environmental Policy Act or NEPA. Section 102(2)(A) of the NEPA calls for a systemic, interdisciplinary approach to integrate natural and social sciences and the environmental design arts in planning and decision making. The team's interpretation has been that this statutory direction, combined with the President's Council on Environmental Quality (CEQ) regulations requires that we:

- Integrate the NEPA process into early planning to ensure appropriate policy considerations to eliminate delay [40 CFR 1501.1(a)].
- Provide a productive atmosphere for early cooperative agency consultation to lay the groundwork for noncontroversial review on future NEPA documents [40 CFR 1501.1(b)].
- Identify significant environmental issues and deemphasize insignificant issues early in the planning process so as to narrow the scope of future NEPA processes and documents [40 CFR 1501.1(d)].

The following sections of the report update baseline information generated in the first phase of the project as well as provide a more focused look at issues that have risen to the top in the second phase. In short, the CAP and public processes were useful in generating a thorough inventory and understanding of both baseline existing conditions as well as potential impacts that are of particular local concern that will deserve heightened attention in future county or NEPA level projects. The following sections were initially generated in the first phase and augmented/refined in the second phase. They provide information on the existing FM 150 west corridor, specifically features and constraints related to land uses and cultural and environmental resources. In addition, they summarize the key features, points of interest and context zones that were developed based on field observations and stakeholder input to identify areas with similar and unique characteristics. Within each of these discipline sections, key issues called out by CAP members and other stakeholders will be addressed. The issues are many, as would be expected with a project of this magnitude, and are certainly not resolved in this document; however, it represents a good faith effort to identify and discuss the most significant ones.

3.4.1 Existing Land Uses

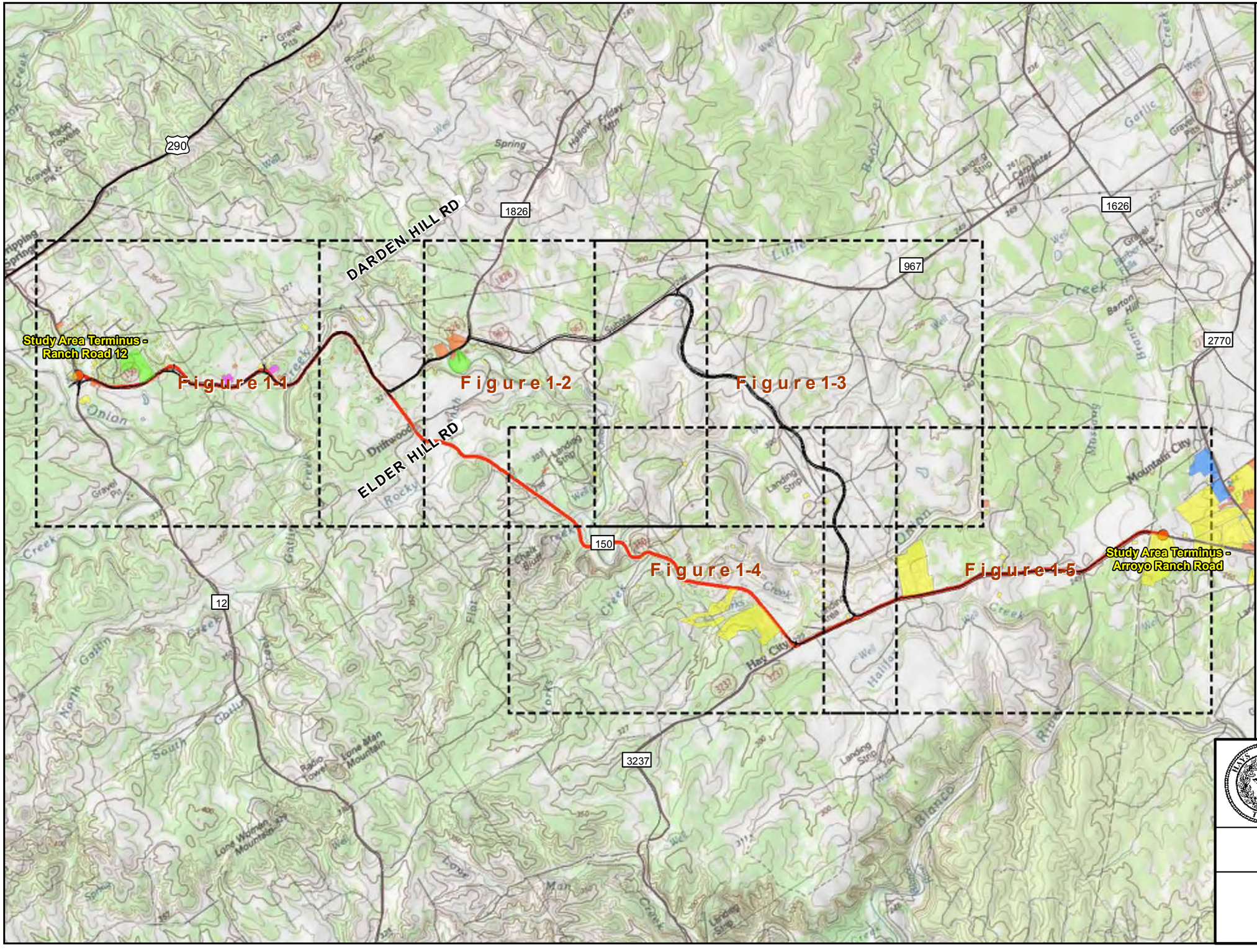
The FM 150 corridor traverses portions of Dripping Springs, Driftwood, and Kyle entirely within Hays County, Texas. Between these communities, land uses in the corridor are characterized primarily as rural residential, as well as some commercial in a matrix of agricultural (primarily ranching) uses. The predominant agricultural land use is changing as large lot residential subdivisions are platted and built along the corridor; however, there are also conversions to open space/conservation easements. Common agricultural land uses include grazing (cow-calf, sheep and goat), vineyard and wildlife focused operations. Although deep soils are found along drainages, row crop agriculture is not currently represented in the corridor's agricultural landscape in this rocky hill country terrain. A summary description of existing land uses and key features at prominent locations along the corridor follows and the overall land use study area is illustrated on Exhibit 21 (more detailed exhibits are provided in Section 6 of Volume 2). In addition to this overview, more detail regarding corridor land uses, including a list and mapped locations of businesses, subdivisions, ranches, community resources and open spaces can be found in Section 6 of Volume 2.

The primary issues documented during the study period regarding land uses all revolve around development related changes being experienced along the corridor. Many new subdivisions will put hundreds of homes on the ground and drivers on the road over the next decade. In the Dripping Springs end of the corridor alone, over 700 homes will be constructed in the vicinity of the RM 12 intersection. In the center of the project area over 1,600 homes are planned in four developments along FM 1826 and FM 967 near FM 150. All of these developments have commercial components, utilities and, ultimately, schools associated with them. The same is true at the Kyle end of the corridor with over 1,800 homes proposed at the Anthem Development just east of the project terminus. Even over the course of this three year study, several new businesses have been built along the roadway; primarily on the Dripping Springs end of the corridor.

At a basic level, a primary concern to stakeholders along the corridor is the potential to lose land to impending roadway improvements. These concerns extend to residential, commercial and institutional owners alike. There are concerns with existing and pending developments at intersections, large lot residential single family owners concerned about right of way widening, ranching families concerned about impacts to their home places, and institutional entities, such as the City of Austin, concerned about taking and/or impacting conservation lands. For most, the concerns rise above individual and direct impacts to properties and extend to a more holistic sense that a series of seemingly minor projects might collectively and incrementally change the very fabric of the landscape along this cherished corridor. There is a recurring comment that captures this sentiment: "Keep it just like it is-2 lane *undeveloped* is rural, and that's the attraction, not subdivisions and box stores. The only thing you should be considering on 150 is basic safety concerns and using the funds to buy more conservation land along 150." These development pressures and concerns underscore the value of this planning process and dialogue.

3.4.2 Key Features and Points of Interest

- RM 12 and FM 150 intersection: This portion of the corridor has primarily commercial and residential land use. One historic cemetery and historical marker (Philips Cemetery), three named residential subdivisions (Caliterra, Springwood and Howard Ranch Subdivision), and two businesses (Twisted X Brewing Company and Bella Nido B&B) are located at the FM 150/RM 12 intersection. Hays County and the City of Dripping Springs envision a connection of FM 150 and US 290 West in the future. This would likely carry FM 150 beyond RM 12; however, where it would connect to US 290 has not been determined. Any proposed corridor would likely cross Onion Creek twice. Ultimately connecting FM 150 and RM 12 to US 290 provides an opportunity for future transportation projects to help relieve congestion by diverting the alignment and associated traffic away from the existing RM 12/US 290 intersection. The existing intersection is being evaluated for realignment and has numerous land uses that will make this challenging, including existing and currently developing residential subdivisions, businesses, and Phillips Cemetery.



N

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Miles

One inch equals 1.25 miles

Key to Features

- FM 150
- Conceptual Project Alignments

Land Use Types

- Cemetery
- Church
- Commercial
- Park
- Public Facility
- Residential
- School
- Utility

FM150 CHARACTER PLAN

HAYS COUNTY

EXHIBIT 21. LAND USE
FM 150 STUDY AREA

- Flying Horseshoe Ranch: This property, located on West FM 150 near the Darden Hill Road intersection, has been recognized by the Texas Department of Agriculture (TDA) Family Land Heritage Program. This recognition program honors families that have owned and continuously operated an agricultural property for 100 years or more in Texas.
- Community of Driftwood: Located on either side of the crossroads of FM 150 and Elder Hill Road, this area is a small but important community. The US Post Office for Driftwood (shown in Exhibit 22), the Driftwood Community Center, and the Driftwood United Methodist Church and Cemetery are key features in this area. These form the heart of this historic community and are the center of activity for residents' everyday life. Both the church and cemetery are commemorated with historical markers. As the traffic increases on FM 150, impacts to daily life and special events in the area, including the annual Driftwood Mayfest and Chiggerfest, raise questions about the best way to serve future FM 150 demands. Through this planning process, the CAP and Driftwood residents advocated for a new location bypass instead of any significant improvements to existing FM 150. A project of the scale needed to bypass Driftwood will require substantial planning and resources that will be addressed further through processes involving Hays County, TxDOT and other stakeholders in the community.

Exhibit 22. Old Driftwood Post Office

Exhibit 23. Low Water Crossing of Onion Creek

- Low water crossings of Onion Creek: These adjacent crossings, formed where the creek turns back upon itself, are a valued natural component of the FM 150 corridor to the citizens; many of whom wish for this portion of the roadway to remain untouched. Exhibit 23 shows FM 150 at one of the low water crossings. To most that pass through these crossings, it is a place of striking beauty that has come to embody the very essence of iconic, natural Texas Hill Country. However, during and after heavy rain, these crossings flood and become impassable; therefore, a reliable and safe solution needs to be considered in the long-term for this area. Although not proposed specifically in this planning project, solutions could include improvements to the existing crossing (e.g., raising the roadway elevation) or a new alignment around the existing crossing.
- Camp Ben McCulloch National Register Historic District and Rogers Ranch: Camp Ben McCulloch is located within the potential bypass study corridor along Onion Creek and just east of the intersection of FM 1826 and FM 967. The National Register-listed district is unique in that it is a historic property that is still used for camping and reunions but also has a spring inhabited by endangered species. A historical marker on the property commemorates the history of the site. Just around the corner from Camp Ben McCulloch on FM 967 is the Joseph B. Rogers House. It is a Recorded Texas Historic Landmark (RTHL) and includes a historical marker. The Rogers Ranch, established in 1869, has also been honored by the Family Land Heritage Program.
- FM 150 and FM 3237 Intersection: This intersection provides a unique challenge for the future of the FM 150 corridor, as the traffic traveling southeast along FM 150 must come to a stop before proceeding east on FM 150. Traffic traveling northwest along FM 150 must make a right turn to stay on FM 150, as shown in Exhibit 24. The intersection has several commercial businesses, Hays City Store and Mad Rooster Beer, Wine and Spirits (formerly Precinct Line Beer & Wine Store), which rely on the FM 150 and FM 3237 traffic. Therefore, any modifications to this intersection must consider smooth and consistent traffic flow while providing the commercial businesses with the necessary infrastructure to flourish. This intersection is being considered for a roundabout and a key issue became avoidance of a large live oak in the conceptual design. Another issue raised by stakeholders is the need for improvements to the Yorks Creek crossing of FM 150 located approximately 4,500 feet north of the intersection. The propensity for simultaneous road-closings at this crossing and the Onion Creek crossings strands residents between the two at times for days.
- Michaelis Ranch, a National Register Historic District: The Michaelis Ranch, established in 1898, is located just east of the southern

Exhibit 24. Existing Roadway (westbound approach on FM 150)

terminus of the study corridor near Kyle.

- Transition to the FM 150 Alignment Study: Hays County is currently involved with TxDOT in preliminary engineering and environmental documentation of a proposed connection from I-35 to FM 150 in a separate project from this FM 150 West Character Plan. It will be critical to mesh the east and west corridor elements as seamlessly as possible between suburban Kyle and the more rural attributes of the western portion of the corridor.

3.4.3 Cultural and Environmental Resources

Natural and human environment resources evaluated, at this preliminary planning level, include:

- Surface water resources,
- Groundwater resources,
- Vegetation,
- Wildlife,
- Community resources, and
- Cultural resources.

Multidisciplinary environmental studies under the NEPA would be anticipated for future projects of any significance. These studies could be Categorical Exclusion (CE), Environmental Assessment (EA) or Environmental Impact Statement (EIS) level, depending upon the location, nature of impacts, and level of controversy. Such environmental studies would include community impact analyses (including Environmental Justice and Limited English Proficiency analyses), biological (including all rare and listed species and their habitats), geological, surface water/wetlands, groundwater and floodplain evaluations and cultural resources (historical and archeological) analyses. Exhibit 25 illustrates the overall study area of potential environmental and cultural resource constraints. Detailed figures illustrating these potential constraints are provided as Figures 1-1 through 1-5 in Section 7 of Volume 2.

Water Resources

Surface Water

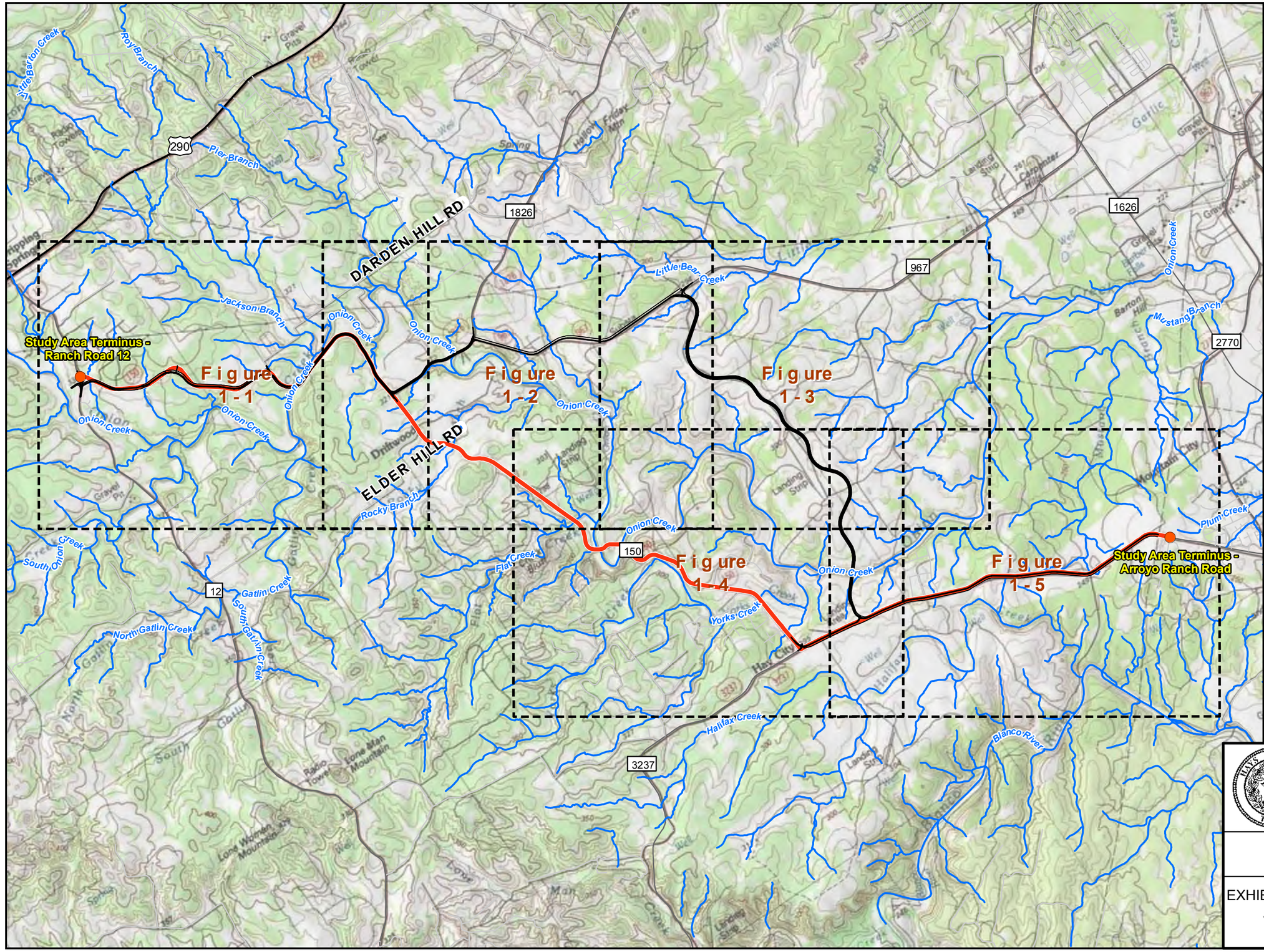
The FM 150 corridor traverses the Onion Creek watershed in the Colorado River Basin and the Blanco River watershed within the Guadalupe River Basin. Multiple tributaries to Onion Creek and associated floodplains cross the study corridor and Onion Creek itself crosses FM 150 three times within the study corridor. Other named creeks within the corridor include Flat Creek, Rocky Branch and Yorks Creek. The stretch of Onion Creek within the corridor has been identified by Texas Parks and Wildlife Department (TPWD) as having unique ecological value due to high water quality, diverse aquatic life and high aesthetic value (TPWD 2016). Future projects would require further analysis to ensure compliance with local, State and Federal laws, such as Sections 404, 401, and 402 of the Clean Water Act, as well as coordination with the local floodplain administrator.

While none of the second phase surface water issues raised were particularly new, they were underscored a number of times and will remain prominent in any future NEPA studies. The fairly instant connection between surface water to groundwater via karst features (caves, sinks and other dissolution cracks and cavities) heightens the importance of sound approaches to avoidance or minimization of potential impacts in NEPA alternatives analyses and subsurface disturbances such as bridge pier drilling and stormwater best management practices during construction phases of future projects. These considerations will be particularly important at creek crossings and in the vicinity of known karst features; particularly those that are downstream of improvements. In addition to water quality issues, water quantity and flooding issues are a concern for all stakeholders. These relate to road closures, design and regulatory challenges in FEMA floodplains and the dangers of flash flooding on these rural roads. There are sections of the existing FM 150, notably at the three Onion Creek crossings, that pass through FEMA floodplains. Any future projects will face design and permitting challenges in these stretches and it is quite possible that, given pending development scenarios in the watershed, these floodplain boundaries could enlarge.

Groundwater

Portions of the FM 150 study corridor are underlain by the Edwards Aquifer; one of the most productive aquifers in the country. The Barton Springs Segment of the Edwards Aquifer lies beneath the FM 150 corridor and is the middle of three hydrogeologically distinct segments. This segment flows from an area north of Kyle, Texas to its major discharge at Barton Springs in Austin, Texas. This aquifer is composed of partially dissolved limestone making it highly permeable and therefore vulnerable to surface pollutants. Because of this permeability, water levels and spring flows respond quickly to rainfall, drought, and pumping (TWDB 2015). Recharge to the Edwards is primarily from percolation of surface water through faults and fractures, direct infiltration of precipitation, and internal flow of groundwater from the adjacent Trinity Aquifer (Ryder 1996). The aquifer's primary use is for municipal, irrigation, and recreational purposes (TWDB 2014). A review of the Texas Commission on Environmental Quality and the Texas Water Development Board records was conducted to identify documented water well locations. Documented wells, springs, and known cave areas that occur within the FM 150 study corridor are illustrated in Figures 1-1 through 1-5 in Section 7 of Volume 2.

Title 30 Texas Administrative Code Chapter 213 defines rules that address activities that could pose a threat to water quality in the Edwards Aquifer, including wells and springs fed by the aquifer and water sources to the aquifer, including upland areas draining directly to it and surface streams. These rules, often referred to as the "Edwards Rules," apply specifically to the Edwards Aquifer in eight counties including Medina, Bexar, Comal, Kinney, Uvalde, Hays, Travis and Williamson. The rules are not intended for any other aquifers in Texas. Portions of the study corridor are located within the Edwards Aquifer Recharge, Contributing and Transition Zones (Figures 1-1 through 1-5 in Section 7 of Volume 2); therefore, the Edwards Aquifer Rules, as described in 30 TAC 213, would apply to future projects within the FM 150 study corridor.



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Miles

One inch equals 1.25 miles

Key to Features

- FM 150
- Conceptual Project Alignments
- Rivers and Streams

HAYS COUNTY

FM150 CHARACTER PLAN

EXHIBIT 25. POTENTIAL ENVIRONMENTAL AND CULTURAL CONSTRAINTS
FM 150 STUDY AREA

Concerns over groundwater impacts were probably one of the most significant areas of issue generation in the second phase of this study. These concerns are overshadowed by the development boom going on in the corridor and how potential roadway improvements are perceived to either invite or facilitate development. Many, if not most, of the corridor residents away from city utility infrastructure rely on Edwards Aquifer well water and their concerns for the future are valid as their attractive piece of Hill Country develops. Secondly, discoveries even over the term of the project, of new locations of protected species such as the federally listed Endangered Barton Springs salamander (*Eurycea sosorum*) that rely upon spring flow raise new challenges for all involved to determine how to balance the needs of a rapidly growing populace with the preservation of these groundwater resources and the species that depend upon them. Barton Springs salamanders have been documented at a number of spring outlets along Onion Creek and one or two on Little Bear Creek; both on private and publicly owned land. Known locations of these salamanders, as well as springs and water wells, are included in Figures 1-1 through 1-5 in Section 7 of Volume 2. It should be noted that these localities come from a variety of generally public database sources and were not derived from field investigations.

Vegetation

Over the course of the two phases of study on this project, it is clear that the stakeholders share intrinsic values for the vegetation of the area. It is impossible to separate the charm of and affection for the Texas Hill Country from its characteristic little bluestem and live oak cloaking of vegetation. Time and time again, stakeholders have advocated for the preservation of large, stately trees; particularly in roadway sections proposed for widening or intersection improvements. Specifically, stakeholders seek to protect the large live oak at FM 150/FM 3237 and large pecans at Onion Creek crossings and sections that parallel Onion Creek. Generally, they seek to protect them everywhere and this should be an important theme to consider in future roadway projects. Stakeholders expressed concerns related to direct impacts as well as indirect impacts associated with the potential spared of oak wilt, a fungal disease that can be spread rapidly both through interconnected roots as well as improper trimming practices. A description of FM 150 vegetation from both regional and site specific perspectives follows. Site specific vegetation descriptions are based upon observations made from FM 150 and work done on properties along the corridor.

The FM 150 study corridor occurs within the Edwards Plateau ecoregion. This ecoregion is primarily a dissected limestone plateau that is hillier to the south and east where it is easily distinguished from bordering ecological regions by a sharp fault line. The region contains a sparse network of perennial streams. Covered by juniper-oak savanna and mesquite-oak savanna, most of the region is used for grazing beef cattle, sheep, goats, exotic game mammals, and wildlife (Griffith et al. 2007). The Ecological Mapping Systems of Texas (EMST) GIS database was searched and categorizes vegetation within the FM 150 Corridor into 35 different communities (TPWD 2014). These vegetation communities are listed in Section 8 of Volume 2. According to The Vegetation Types of Texas (McMahan et al. 1984), the FM 150 corridor is situated within a transitional area between Live Oak-Ashe Juniper Parks and Live Oak-Mesquite-Ashe Juniper Parks. These areas vary from open savannah to nearly 100 percent closed canopy oak-juniper woodland with a diverse deciduous tree and understory component.

Dominant upland tree species include:

- Ashe juniper (*Juniperus ashei*)
- Plateau live oak (*Quercus fusiformis*)
- Texas oak (*Q. texana*)
- Shin oak (*Q. sinuata* var. *breviloba*)
- Post oak (*Q. stellata*)
- Cedar elm (*U. crassifolia*)
- Texas ash (*Fraxinus texensis*)
- Cat claw acacia (*Acacia roemeriana*)
- Honey mesquite (*Prosopis glandulosa*)

Typical understory species include saplings of the aforementioned trees, wafer ash (*Ptelea trifoliata*), yaupon (*Ilex vomitoria*), elbow bush (*Forestiera pubescens*), and Lindheimer's silk tassel (*Garrya ovata* ssp. *lindheimeri*). Giant ball moss (*Tillandsia baileyi*) is commonly found on both overstory and understory trees.

The same species occur in the riparian corridors and canyons along with more mesic adapted tree and shrub species such as:

- Bald cypress (*Taxodium distichum*)
- Pecan (*Carya illinoensis*)
- Black willow (*Salix nigra*)
- Bur oak (*Q. macrocarpa*)
- Escarpment cherry (*Prunus serotina*)
- Sycamore (*Platanus occidentalis*)
- Carolina buckthorn (*Frangula caroliniana*)
- Sugar hackberry (*Celtis laevigata*)
- Deciduous yaupon (*I. decidua*)
- Buttonbush (*Cephalanthus occidentalis*)
- Wafer ash

Typical understory species include saplings of the aforementioned trees, redbud (*Cercis canadensis* var. *texensis*), yaupon, and elbow bush. Woody vines are most commonly found along tributary and creek corridors and include grapevines (*Vitis* sp.), greenbriar (*Smilax bonanox*), and poison ivy.

Typical woody species along woodland edges and/or in open areas include:

- Agarita (*Mahonia trifoliolata*)
- Mountain laurel (*Sophora secundiflora*)
- Eve's necklace (*Sophora affinis*)
- Texas persimmon (*Diospyros texana*)
- Texas kidneywood (*Eysenhardtia texanum*)
- Twistleaf yucca (*Yucca rupicola*)
- Prickly pear (*Opuntia englemannii*)
- Pencil cactus (*O. leptocaulis*)
- Horse crippler (*Echinocactus texensis*)
- Lace cactus (*Echinocereus reichenbachii*)

Typical woody species in disturbed and/or open areas include chinaberry (*Melia azedarach*), poverty weed (*Baccharis neglecta*), and fragrant mimosa (*Mimosa borealis*).

Common herbaceous species in shaded areas and/or along riparian corridors include:

- Cedar sedge (*Carex planostachys*)
- Cedar sage (*Salvia roemeriana*)
- Annual pennyroyal (*Hedeoma acinoides*)
- Scarlet leatherflower (*Clematis texensis*)
- Widow's tears (*Commelina erecta*)
- Frostweed (*Verbesina virginica*)
- Lanceleaf frogfruit (*Phyla lanceolata*)
- Canada wildrye (*Elymus canadensis*)
- Virginia wildrye (*E. virginicus*)
- Switchgrass (*Panicum virgatum*)
- Green milkweed vine (*Matelea reticulata*)

Switchgrass, frogfruit, and loose-flower water willow (*Justicia ovata*) are the dominant herbaceous species within creek banks.

Typical upland herbaceous species include:

- Little bluestem (*Schizachyrium scoparium*)
- Texas wintergrass (*Nassella leucotricha*)
- King Ranch bluestem (*Bothriochloa ischaemum*)
- Silver bluestem (*B. laguroides*)
- Side-oats grama (*Bouteloua curtipendula*)
- Texas grama (*B. rigidiseta*)
- Hairy grama (*B. hirsuta*)
- White milkwort (*Polygala alba*)
- Redseed plantain (*Plantago rhodospermum*)
- Common mullein (*Verbascum thapsus*)
- Texas bluebonnet (*Lupinus texensis*)
- Prairie verbena (*Verbena bipinnatifida*)
- Indian blanket (*Gaillardia pulchella*)
- Plains coreopsis (*Coreopsis tinctoria* var. *tinctoria*)
- Mexican hat (*Ratibida columnaris*)
- Beebalm (*Monarda* sp.)
- Slender-leaf bitterweed (*Tetraneuris linearis*)
- White heliotrope (*Heliotropium tenellum*)
- Butterfly milkweed (*Asclepias tuberosa*)
- Texas thistle (*Cirsium texanum*)
- White prickly poppy (*Argemone albiflora*)
- Orange zexmenia (*Wedelia texana*)
- Rabbit tobacco (*Evax prolifera*)
- Drummond's skullcap (*Scutellaria drummondii*)
- Lady bird's centaury (*Centaurium texensis*)
- Texas lantana (*Lantana texensis*)

Wildlife

A high diversity of wildlife species exist in Central Texas. Vertebrate species known to occur within Hays County includes 44 mammals, 32 snakes, 17 lizards, 11 turtles, 20 frogs and toads, 7 salamanders and the American alligator (Davis and Schmidly 1997; Dixon 2013). Additionally, 431 species of birds have been documented to occur within the Edwards Plateau Ecoregion (TPWD 2008). Multiple federal and state-listed threatened, endangered or candidate species for federal listing, as well as Species of Greatest Conservation Need (SGCN), have been documented by both the U.S. Fish and Wildlife Service (USFWS) and Texas Parks and Wildlife Department (TPWD) as potentially occurring in Hays County. Three federally listed endangered species in particular, the Barton Springs Salamander, the Golden-cheeked Warbler (*Setophaga chrysoparia*) and Black-capped Vireo *(Vireo atricapilla)*, are known to occur within the study corridor. Figures 1-1 through 1-5 in Section 7 of Volume 2 illustrate known occurrences of the salamander as reported by City of Austin biologists (Personal communication from T. Devitt to John Kuhl, August 22, 2017) and areas of potential low, medium, or high quality habitat for the Golden-cheeked Warbler within the study corridor. Additional information regarding salamander locations is anticipated to be available in the next few months when an upcoming publication becomes available. The warbler habitat zones are simply existing GIS layers from a habitat model by Morrison et al (2010) and do not represent specific mapping by this project team. The project team does however, have specific experience on FM 150 corridor properties in the canyons along Onion Creek that are occupied by Golden-cheeked Warblers. Stakeholders have also mentioned the presence of warblers on other properties along Onion Creek and on nearby properties off the corridor. The Black-capped Vireo is less well documented; however, at least one individual has been documented on the Little Bear tract on City of Austin Water Quality Protection Lands in Hays County in the 2014 survey season (Personal Communication from K. Thuesen to John Kuhl, July 2015). Hicks & Company biologists have also documented single occurrences of the vireo in atypical habitat in areas south and west of Kyle, Texas near the corridor; however, we are not aware of a regularly documented breeding occurrence along the corridor.

Future projects would require much more detailed analyses of potential impacts to wildlife including all potentially occurring listed species and TPWD SGCN. These analyses would be conducted in compliance with USFWS and TPWD regulations. A complete list of potentially occurring rare, threatened and endangered species for the project area can be found in Section 9 of Volume 2. The table also discusses whether potential habitat may be found along the project corridor and generally discusses the potential for the species to present issues on future projects.

Open Space and Preserves

Due to the rural, undeveloped nature of the corridor and its propensity for recharge, it has been a conservation priority for the City of Austin (COA) and various other entities for nearly 20 years. In 1998, the COA proposed bond funding to acquire and manage land over the recharge and contributing zones to enhance water quality and quantity in the aquifer. This bond item passed and the Water Quality Protection Land program was formed within the Austin Water Utility. To date, the program manages over 26,000 acres (9,000 in fee simple and 17,000 in conservation easements) (https://www.austintexas.gov/department/water-quality-protection-land, accessed 2/3/16).

There are a number of other entities that assist private landholders with conservation easements on their lands. To quote from the Texas Land Trust Council,

> *A conservation easement is a **voluntary, written agreement** between a landowner and the "holder" of the conservation easement under which a landowner voluntarily restricts certain uses of the property to protect its natural,*

productive or cultural features. The holder of the conservation easement must be a governmental entity or a qualified conservation organization. With a conservation easement, the landowner retains legal title to the property and determines the types of land uses to continue and those to restrict. As part of the arrangement, the landowner grants the holder of the conservation easement the right to periodically assess the condition of the property to ensure that it is maintained according to the terms of the legal agreement.

In addition to those held by the COA, multiple private preserves and conservation easements occur within or adjacent to the study corridor. At least three organizations hold easements along the corridor. These include the Nature Conservancy of Texas, the Hill Country Conservancy and the Guadalupe Blanco River Trust. Generally, these groups seek to preserve large tracts of land to conserve critical water features, preserve outdoor recreation opportunities, and help maintain the Hill Country's unique quality of life. Mapped data acquired from the COA and the Hill Country Conservancy illustrating the location of preserves and conservation easements within the study corridor are presented in Figures 1-1 through 1-5 in Section 7 of Volume 2.

Cultural Resources

The FM 150 corridor has many documented prehistoric and historic sites and properties. It is important to note that the majority of the corridor has not been surveyed professionally for archeological sites or historic-age structures. These processes would not occur until a project is identified and initiated. A brief overview of the types of recognized historic resources is followed by a brief summary of known historic sites along the corridor. This is not to be interpreted as a comprehensive historic resources survey report or a complete listing of potential historic sites in the corridor because a survey has not been conducted as part of this study.

National Register of Historic Places: The National Register of Historic Places (NRHP) is the official list of historic places deemed worthy of preservation throughout the United States. In Texas, it is administered by the Texas Historical Commission (THC) in coordination with the National Park Service. National Register designation provides recognition of a property's historical, architectural, or archeological significance and denotes that it is worthy of preservation. Buildings, sites, objects, structures, and districts are eligible for National Register designation if they are at least 50 years old (with rare exceptions) and meet established criteria. Section 106 of the National Historic Preservation Act requires that any project undertaken with federal funding or a federal permit must consider the impact that the project may have on properties listed in or eligible for listing in the National Register (THC 2017). There are two National Register Historic Districts in the corridor: Camp Ben McCulloch and Michaelis Ranch. While there are many other historic-age properties within the corridor that may be eligible for listing in the National Register, recommendations for National Register eligibility have not been made at this time and would be done as part of future environmental studies for a proposed project.

State Antiquities Landmarks: State Antiquities Landmarks (SALs) are designated by the THC and receive legal protection under the Antiquities Code of Texas (the Code). The Code defines all cultural resources on non-federal public lands in the State of Texas as eligible to be designated as SALs. Historic buildings must be listed in the NRHP before they can be designated as SALs, but archeological sites do not have the same prerequisite. While SAL designation does not mean that sites or buildings cannot be altered or destroyed, a political subdivision of the state (like Hays County or TxDOT) must consult with the THC about such proposed actions potentially affecting designated SALs through a permit process, and the THC will determine whether the work will be allowed (THC 2017).

Recorded Texas Historic Landmark: Recorded Texas Historic Landmarks (RTHLs) are properties that have been designated by the THC as historically and architecturally significant and worthy of preservation. RTHL properties are protected under state law. The THC has review authority over exterior changes to RTHL properties and requires notification of proposed changes 60 days in advance to allow time for review and comment. Within the corridor, the Joseph B. Rogers House on the Rogers Ranch is an RTHL.

Official Texas Historical Marker: Official Texas Historical Markers (OTHMs) commemorate significant sites and properties associated with state history. These include subject markers as well as markers for designated RTHLs. There are five OTHMs within the corridor: Camp Ben McCulloch, Phillips Cemetery, Driftwood Cemetery, Driftwood Church, and the Joseph B. Rogers House.

Family Land Heritage Program: The Family Land Heritage Program, administered by the Texas Department of Agriculture, honors families that have owned and continuously operated an agricultural property for 100 years or more in Texas. This is a commemorative program that celebrates the legacy of Texas farmers and ranchers. Properties receiving this recognition are included in the Family Land Heritage Registry. There is no regulatory oversight for these properties, and the recognition is purely honorary. Two properties within the project study are Family Land Heritage Program honorees: the Rogers Ranch (9655 FM 967) and the Flying Horseshoe Ranch (20601 West FM 150). In response to stakeholder interest, detailed write ups on these two ranches are included in Section 10 of Volume 2 along with another property now referred to as the Lazy Z Ranch that is addressed later in this report.

Corridor Overview of Archeological Sites

Prehistoric archeological sites in central Texas are primarily open campsites situated on alluvial terraces adjacent to rivers and streams and, on occasion, on upland areas such as bluffs and hill tops. Typically, such sites are characterized by chert chipping debris, stone tools, burned rock, fragmented animal bone and, less frequently, charred plant remains. Burned rock middens are a common phenomenon to the central Texas area as well as in the northern extent of the South Texas Plains. Usually, burned rock middens are found in terrace or upland settings and can range in size from a few meters to a hectare. Often, these sites represent multiple occupations dating to different temporal periods. Quarry and lithic reduction sites are also fairly common in central Texas. These sites may represent specialized knapping events of limited duration (lithic scatters), such as retooling, or raw material procurement and stone tool manufacture. In addition to these site types, small, temporary camps, generally comprised of a few hearths, flakes, and the occasional projectile point, are found within the region. Although rare, burial sites and rock shelter sites have also been documented in central Texas (Collins 1995). Two recorded archeological sites occur adjacent to FM 150 and ten recorded sites occur within the

potential bypass study corridor. While the locations of these archeological sites are known by the study team, they are not presented in maps available to the public to protect them from looting and vandalism. Various stakeholders have indicated their knowledge of prehistoric sites along area streams so it is quite likely that additional sites will be found when surveys are initiated for future roadway projects.

Corridor Overview of Historic Sites

Historic archeological sites are common to central Texas and homestead and tenant farm settlements dating to the late nineteenth century are the most common. These sites are typically located on hilltops or hillsides overlooking springs or creeks and contain a combination of foundation remnants, cisterns, wells, barns, and artifact scatters. Historic period cemeteries and family burial plots are also common. These locales do not always contain grave markers and mapped boundaries are often inaccurate; therefore, verification of historic cemetery boundaries is typically necessary prior to ground disturbance within the vicinity. Less common to the area are sites pertaining to the Spanish Colonial Period or the Mexican Period as well as military sites.

In terms of project area historic sites, two National Register Districts, Camp Ben McCulloch and Michaelis Ranch, are located within the study corridor. Camp Ben McCulloch is located within the potential bypass study corridor along Onion Creek and just east of the intersection of FM 1826 and FM 967. Michaelis Ranch is located just east of the southern terminus of the study corridor along FM 150. Five additional resources bearing historical markers are also located along the FM 150 study corridor: Driftwood Church, Driftwood Cemetery, Phillips Cemetery, Camp Ben McCulloch, and the Joseph B. Rogers House (a RTHL). Driftwood Church was originally established as a Methodist Episcopal Church in 1884, moving services from the Reaves School located approximately one mile to the north. Following a fire that destroyed the local Baptist church building in 1911, this structure, now known as the Driftwood United Methodist Church, was shared by the two denominations with both continuing to hold services here today. The Driftwood Cemetery, in use since 1884, is located next to the church and contains reinterments from the Old Community Cemetery, located approximately one mile north near the Reaves School (THC 2015). Reportedly, however, not all of the burials from the Old Community Cemetery were moved, and one double grave marker and evidence of unmarked graves remained behind (Rogers 1970:182).

The Phillips Cemetery is located just south of Dripping Springs and west of Ranch Road 12. This cemetery was established in 1880 on land deeded by John and Nancy Phillips to the Methodist Episcopal Church (Phillips Cemetery Association 2015). The Methodist Church later donated the cemetery to the local community in 1940. Initially, a small church was built on this property, though in 1901, land for a new church building was acquired and the original building was sold and moved. The interment of B. G. Sorrell, who died on March 13, 1880, is the earliest documented burial and many of the graves here are those of early area settlers.

Camp Ben McCulloch is located within the potential bypass study corridor along Onion Creek and just east of the intersection of FM 1826 and FM 967. In the summer of 1896, Confederate veterans and their families gathered near Martin Spring and campsite on Onion Creek and formally organized the Camp Ben McCulloch Chapter of the United Confederate Veterans. These grounds were purchased by the organization in 1904 and have continued as the site of the annual reunion with the exception of one year during World War I (Texas Historical Commission 2015).

The Joseph B. Rogers House is located on FM 967. Joseph Rogers was born in 1833 and served with Terry's Texas Rangers during the Civil War. In the early 1870's he hired local workmen to build his native limestone home. The family has preserved the structure and it became a Recorded Texas Historic Landmark in 1975 (THC 2015). Approximately 100 yards in front of the house a ring of large rocks encircles a small plot of land marking a private burial site. Here within two graves, three children of the Peter Klein family are buried. Though the graves are unmarked, it is likely that the burials occurred during the Civil War (Rogers 1970).

Two additional small, historic-age cemeteries were noted within the vicinity in the 1970 Book, *Driftwood Heritage: The History of Driftwood Texas* (Rogers 1970). The Perry Cemetery is located on property owned by the Collins family. Just east of the main residence members of the Perry family are buried. Three grave markers date this cemetery to the late nineteenth century. The Reaves graveyard is located on property that, as of 2009, was owned by Scott Marshall (Hays County Historical Commission 2016) and is located approximately 1.8 miles south of the FM 150/RR 12 intersection and 0.4 miles east of the FM 150/Woods Loop intersection on the Marshall property. Dates from ten headstones at this graveyard date the interments from 1870-1885.

During the public involvement process in the first phase of this study, the local community including members of the CAP and the Driftwood Historical Conservation Society also identified several additional resources within the study corridor. These include a historic rock wall, the Bella Nido Bed and Breakfast, and the Butler Cemetery. The historic rock wall is located adjacent to FM 150 on a portion of William B Travis' original league of land acquired in 1835. The Bella Nido Bed and Breakfast is a 1905 house that has since been restored, according to information available on their website (http://www.bellanido.com/index.html). An old rock barn is also located on the property. The Butler Cemetery is an approximately two-acre cemetery of historic age located just south of the double low water crossings of Onion Creek and east of FM 150. The cemetery is part of the land that was originally obtained by J.C. Johnson in 1855 from Charles Travis, the son of William B. Travis (Hays County Historical Commission 2016).

In the second phase of the project, stakeholders showed significant interest in the Rogers Ranch as well as a property owned by the Odell Family. The Odell property mentioned by the stakeholder was stated to be where the current Flying Horseshoe or Browning Ranch is located near the FM 150/Darden Hill intersection near Dripping Springs. The Flying Horseshoe Ranch, noted previously as a Family Land Heritage Program honoree, is located approximately four miles southeast of Dripping Springs at 20601 West FM 150. The Flying Horseshoe Ranch was established in 1900 by George Hill Wilson. He purchased 323 acres of land in Hays County from J.F. Fisher and raised corn, cotton, maize, sheep, goats, and cattle.

Background research on the Odell Family led to a connection to a property currently referred to as the Lazy Z Ranch and referenced previously in this report. The Lazy Z Ranch is located at 11300 FM 150 past the double crossings of Onion Creek near the community of Driftwood. The 255-acre property is currently owned by Frank W.

Zimmerman, Jr. Preliminary research indicates that at least part of this property has been historically associated with a number of early community residents including J.C. “Jack” Johnson, John M. Butler, Beverly Butler, the Ed Odell family, and the Zimmerman family. Reportedly, in 1854, early settler J.C. “Jack” Johnson purchased a half league of land (nearly 4,000 acres) from Charles Travis. Charles Travis was the son of William B. Travis and had inherited his father’s original land grant in Hays County. The following year, in 1855, Jack Johnson sold approximately 884 acres to his brother-in-law, John M. Butler. The Butler Cemetery remains on the property. Additional detail on the property is included in Section 10 of Volume 2.

As previously stated, this is merely a summary of known historic sites identified in the THC Atlas and other databases. A full cultural resources analysis would be necessary during the environmental document preparation stage for any future project or projects to fully identify and assess potentially occurring cultural resources and impacts.

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SECTION 4 Master Plan of Improvements

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4 MASTER PLAN OF IMPROVEMENTS

4.1 CORRIDOR CHARACTER

As part of Phase I of the study, the study team identified context zones for FM 150. These context zones characterize land use or physical features that allow corridor study solutions to be tailored to each context zone while serving long range FM 150 corridor needs. Generally speaking, the context zones are common and unique zones along the corridor that include natural, historic, and man-made features noted as valued by the community. In Phase II of the study, context zones were also identified for the upgrade sections of FM 967 and FM 1826. The section of FM 1826 between FM 150 and FM 967 was considered a community zone based on the various activity centers. Exhibit 26 illustrates the corridor context zones, which are described below.

- **Community zone:** community zones feature a concentration of various facilities and destinations, which often means more activity with vehicles turning on/off the roadway.
- **Rural Character context:** large portions of the corridor are undeveloped with few access points and an abundance of natural vegetation. Community input has consistently noted the beauty of the rural, undeveloped nature along the corridor.
- **South section:** the south section of FM 150 has a different character and general feel than most of FM 150. It represents a transition between the relatively rural, undeveloped area north and west of the Hays City community zone to the more suburbanized and developed land use approaching Kyle.
- **Upgrade sections:** FM 967 and FM 1826 will be upgraded between the connection of the bypass and FM 150 in association with an FM 150 bypass segment. Given the various commercial and recreational land uses, this area of FM 1826 was deemed a community zone.
- **Bypass section:** the bypass connects FM 150 and FM 967 and is a new roadway through largely undeveloped property. This segment would likely be considered a Rural Character zone.

Throughout Phase II, corridor-wide and context zone-specific guidance was developed to maintain the character of the corridor. Corridor-wide guidance includes:

- Preserve the area's rural qualities
- Minimize impacts to community resources and character
- Maintain a rural feel and use curb and gutter sparingly
- Follow Dark Sky principles when using lighting

Guidance specific to each section includes:

- Desire for lower speeds in community zones. Curb and gutter may be appropriate in some areas to emphasize the lower speeds and more concentrated uses. Curb and gutter allows a narrower footprint and can reduce impacts.
- Need for transitions in and out of community zones that indicate the change in character through treatments such as a change in cross-section, introduction of curb/gutter, signage, and/or gateway treatment (such as landscaping, narrower cross-section, or roundabout). Transitions may support a speed reduction in addition to alerting drivers of the increased land use activity.

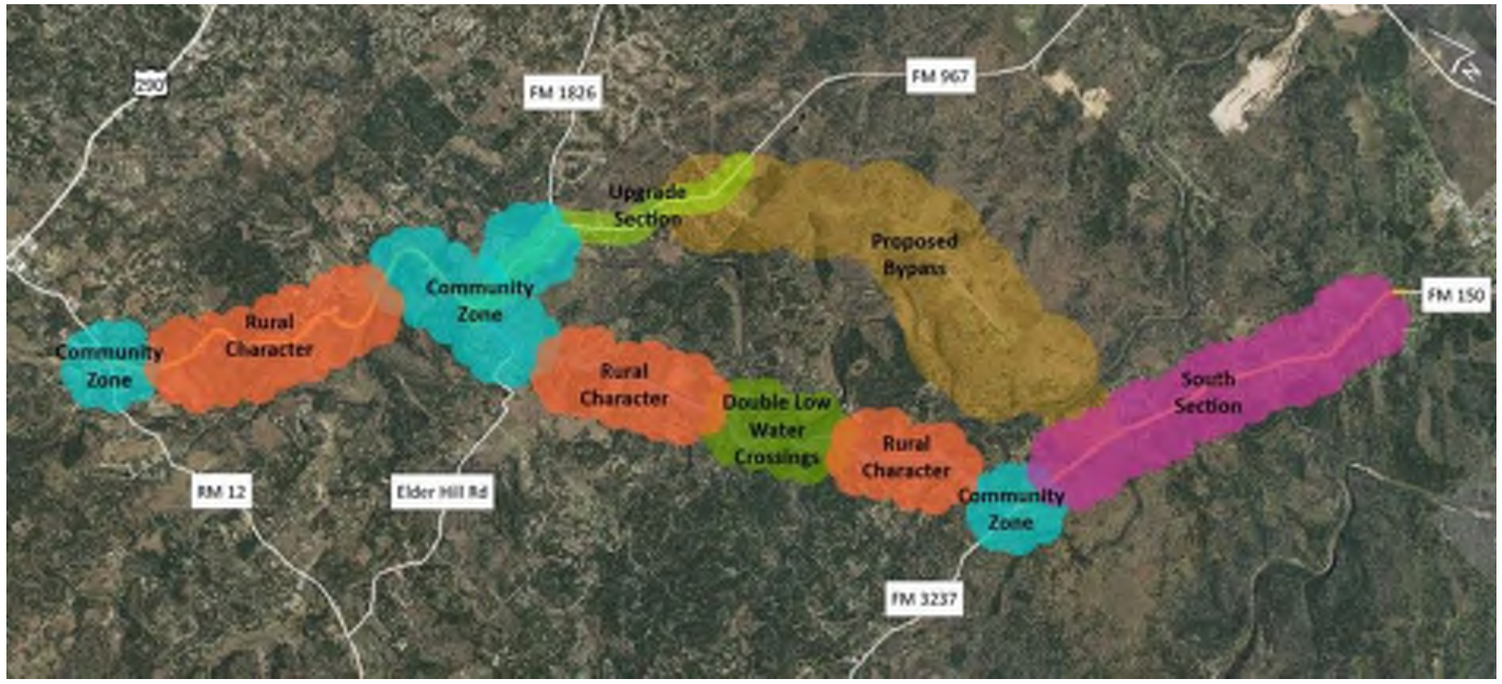


Exhibit 26. Corridor Context Zones

4.1.1 Speeds

Phase I discussions included speed consistency as a means of evaluating and assessing corridor operation. This concept seeks to minimize abrupt changes in driving speeds and uses design flexibility to accommodate constraints along a corridor. The methodology in the FHWA *Speed Concepts: Informational Guide* (Reference 15) was used to review and assess speeds along the corridor and identify areas with abrupt changes in speed. The FHWA describes an "inferred" speed concept to assess roadway geometrics and identifies methods of considering roadway horizontal and vertical alignments to create facilities that result in desired operating speeds. As part of Phase II, target speeds for each context zone were identified and these were used to help guide the design of the corridor while preserving flexibility. The target speeds are shown in Exhibit 27. Reduced target speeds are desired in community zones with transitions to alert drivers to the change. Actual posted speeds will be defined and refined in subsequent design activities.

4.1.2 Forms

General preferences for the corridor form were developed through collaboration with the CAP and community. In general, the CAP and community expressed a preference for:

Segments

- Serving bicyclists and pedestrians along the corridor
- Signs indicating historic locations and businesses, while being mindful of avoiding visual clutter
- Further warnings to alert drivers to curves in the roadway

Intersections

- Delineation to alert drivers to intersections
- Roundabouts because of their slower speeds and ability to minimize impacts at intersections, create a rural feel, and serve as a gateway treatment

Typical cross-sections are shown for each portion of the corridor in Section 4.2 and concepts illustrating the intersection forms are also provided.

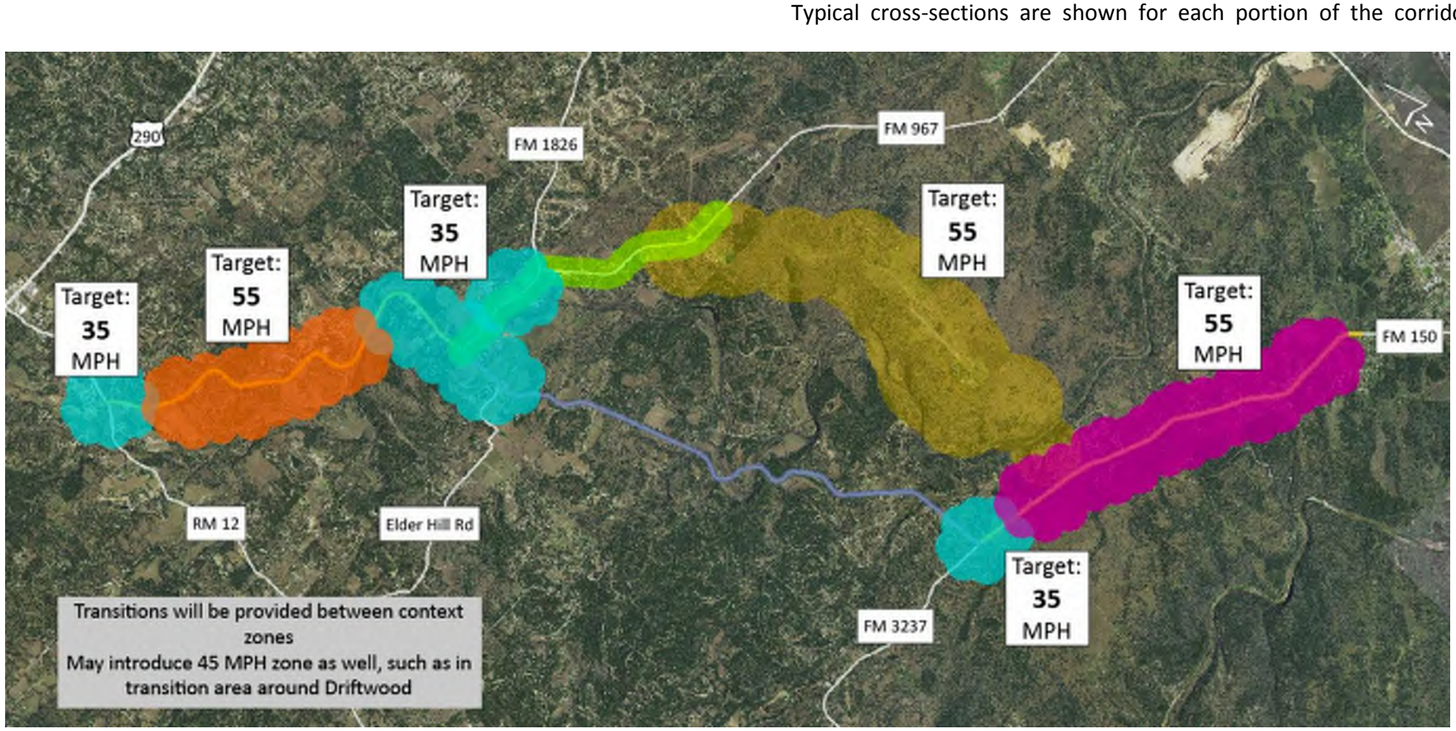


Exhibit 27. Target Speeds

4.2 PROPOSED IMPROVEMENTS

As part of the Phase II study, concepts for the FM 150 corridor were developed through an iterative process with the CAP and public. The proposed improvements are discussed below for the corridor overall and individual segments.

Corridor-Wide

Corridor-wide improvements generally followed the guidelines established in Section 4.1 to maintain the desired character for each context zone. Since the majority of the corridor is located within the Texas Commission on Environmental Quality (TCEQ) Edwards Aquifer Recharge and Contributing Zones, water quality treatment measures will be required to offset increases in impervious surfaces. This influences right-of-way preservation.

A number of factors were considered for corridor right-of-way preservation. These included proposed roadway design elements (travel lanes, shoulders, etc.), roadside drainage and water quality elements, accommodations for pedestrians and bicyclists, potential landscaping and natural feature preservation, and future capacity.

Segments designated as rural character zones will have open drainage conveyed in roadside ditches. TCEQ water quality requirements will be achieved with vegetative filter strips. These segments will have higher target speeds (55 mph). The proposed right-of-way corridor preservation width for these zones is 200-feet.

For segments identified as community zones, the roadway plan considers lower target speeds (30-40 mph) and the possibility of curb and gutter (with underground storm sewer). Curb and gutter precludes the use of vegetative filter strips and roadside ditches and, therefore, require less right-of-way. The right-of-way corridor preservation for these zones is proposed to be 150-feet.

TCEQ water quality requirements for community zones would be achieved though storm sewer treatment devices or water quality ponds. These treatments may require individual right-of-way purchase outside the 150-foot corridor at individual outfall locations.

FM 150 from Arroyo Ranch to FM 3237

This segment, called the South Section, is located between the western boundary of the Arroyo Ranch Subdivision and the intersection with FM 3237 at the Hays City Store. The segment limits are shown in Exhibit 26. This segment has higher daily traffic than the other segments. This segment is planned as a rural zone with a 200-foot wide right-of-way corridor preservation. The proposed concept includes widening the existing roadway to two 12-foot lanes and adding a 14-foot center two-way left turn lane and 6-foot shoulders. The proposed typical section is shown in Exhibit 28.

This segment includes two focus intersections at FM 3237 and the proposed Bypass. Various intersection alternatives were presented to the CAP, including a stop controlled intersection, a signalized intersection, and a roundabout. For both intersections, the CAP preferred roundabouts. For the bypass intersection, the CAP preferred to realign northbound FM 150 to promote south to north travel via the bypass (in lieu of continuing toward FM 3237). Since roundabout approaches typically have speeds of 25-30 mph, the roadway realignment to the bypass could use a smaller radius compared to a stop controlled or signalized intersection where drivers would be travelling at approximately 55 mph. Exhibit 29 illustrates the intersection of FM 150/FM 3237 and Exhibit 30 illustrates the intersection of FM 150/Proposed Bypass.

Bypass

The Bypass segment was identified as a preferred concept during Phase I to avoid extensive reconstruction at the double low water crossings of Onion Creek, which were identified by the community as special to the area. A bypass will accommodate future growth while preserving the unique character of the segment of FM 150 between FM 3237 and FM 1826. During Phase I, undeveloped land owned by the Rutherford family was identified as a potential location for the majority of the Bypass route. The remainder of the Bypass route is located on an undeveloped parcel owned by the City of Austin. While a desirable alignment was developed to assess the concept, the alignment will refined and determined in subsequent study efforts.

The Bypass route concept is influenced by a number of factors. The southern portion of the Bypass passes through a City of Austin property. During meetings with the City, the team was asked to consider alignments that did not bisect the property. Consequently, the alignment was set against the western property line. On that property, the corridor crosses Onion Creek and approaches the creek at a perpendicular configuration to simplify bridge construction across Onion Creek. As the Bypass continues north, the corridor enters the Rutherford property. On the Rutherford property, the alignment was set to run along the ridgeline of the property to minimize drainage impacts to Onion Creek.

A central design approach is to minimize impacts and create a parkway character. Curves create a rolling, rural feel and allow the roadway to better conform to natural features. The curves help manage speed and reduce the extent of cutting and filling to preserve the natural character. Since adjacent lands are undeveloped, access can be managed and minimized to support a parkway character. Exhibit 31 shows a portion of the bypass segment, illustrating the curves and alignment.

The typical section of the Bypass was selected to support the rural feel and complement the curvilinear alignment. There is an opportunity to construct a divided, “parkway” type roadway through this section. The divided roadway creates the opportunity to minimize impacts and better retain existing natural features compared to a conventional highway. This divided section is proposed to have one 12-foot lane in each direction with 4-foot inside and 8-foot outside shoulders. The proposed typical section is shown in Exhibit 28. This area is identified as a rural zone and preserves a right-of-way corridor of 200-feet.

This segment includes two focus intersections, the previously discussed FM 150 south section intersection and the connection to the FM 967 upgrade section. Various bypass alignments and intersection options were presented to the CAP including stop controlled, signalized, and a roundabout forms. Like at the south section, the CAP preferred a roundabout at FM 967 and bypass concept alignment that serves the south to north travel. Exhibit 32 illustrates the intersection of FM 967/Proposed Bypass.

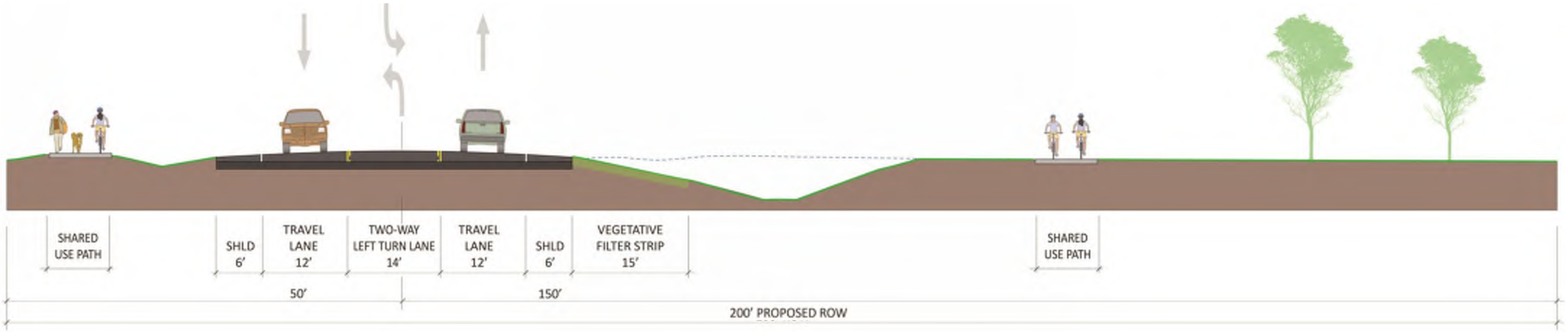
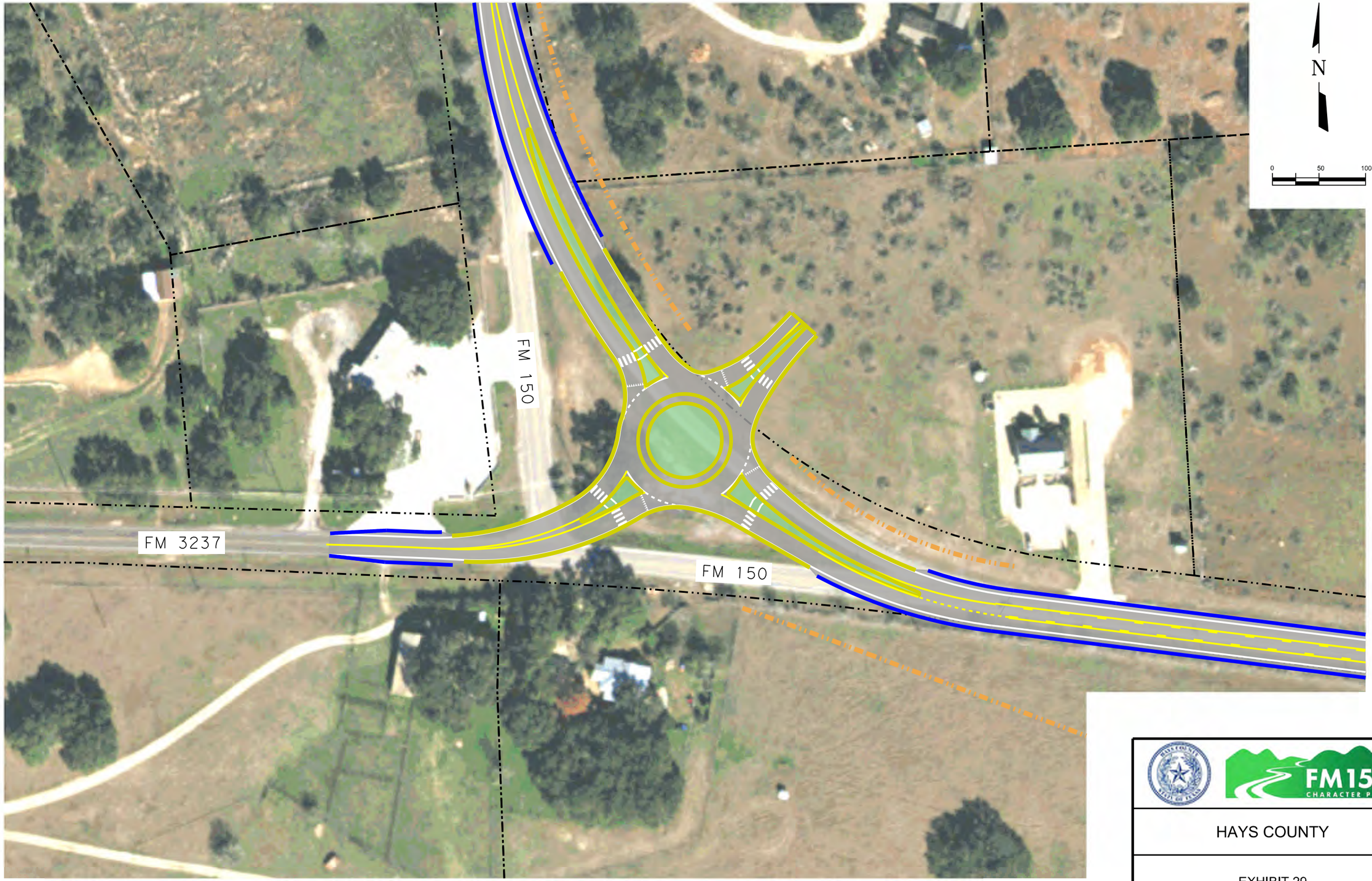


Exhibit 28. Typical Section FM 150 from FM 3237 To Arroyo Ranch (top) and bypass (bottom)



HAYS COUNTY

EXHIBIT 29
INTERSECTION OF FM 150/FM 3237

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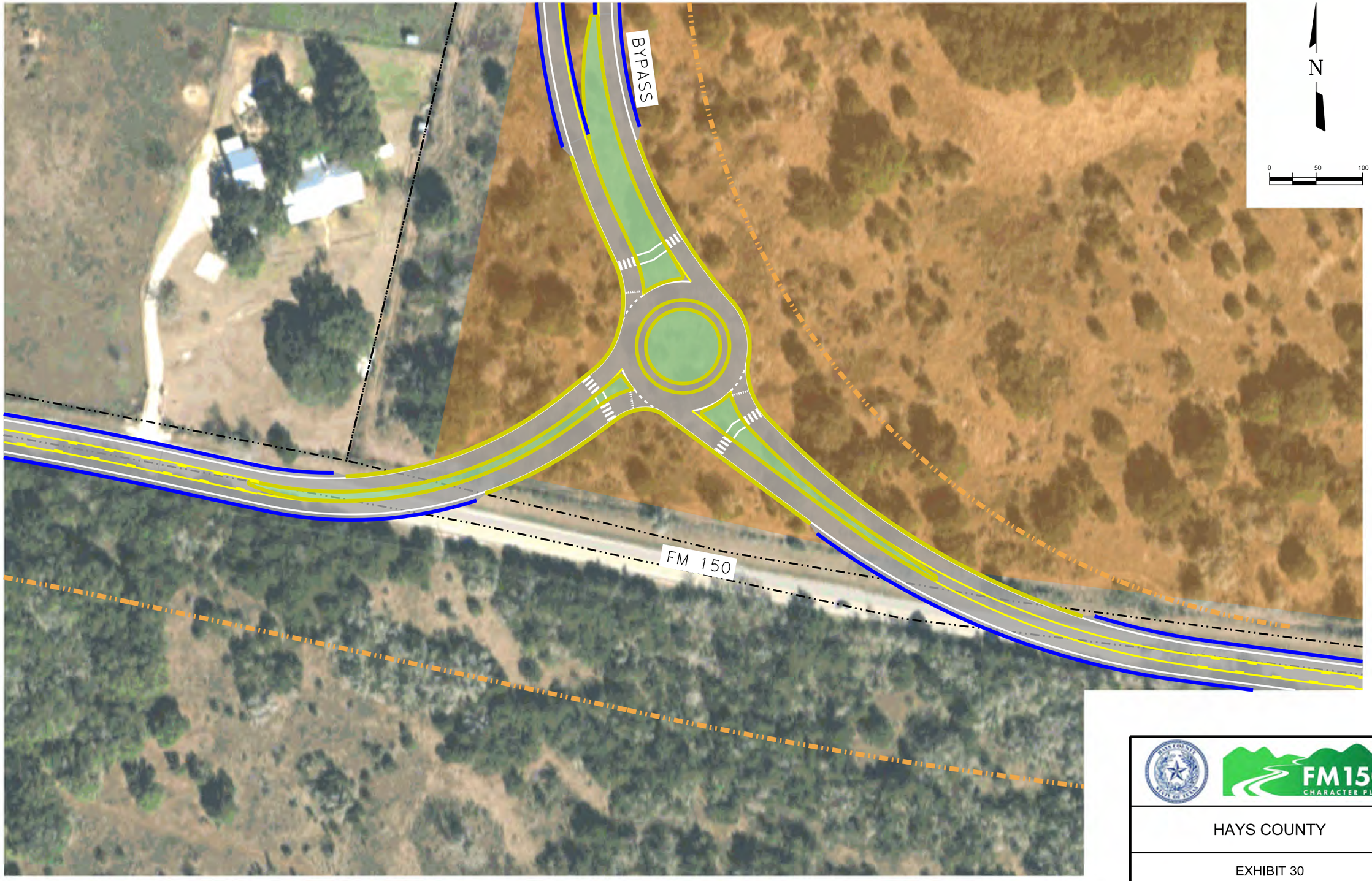
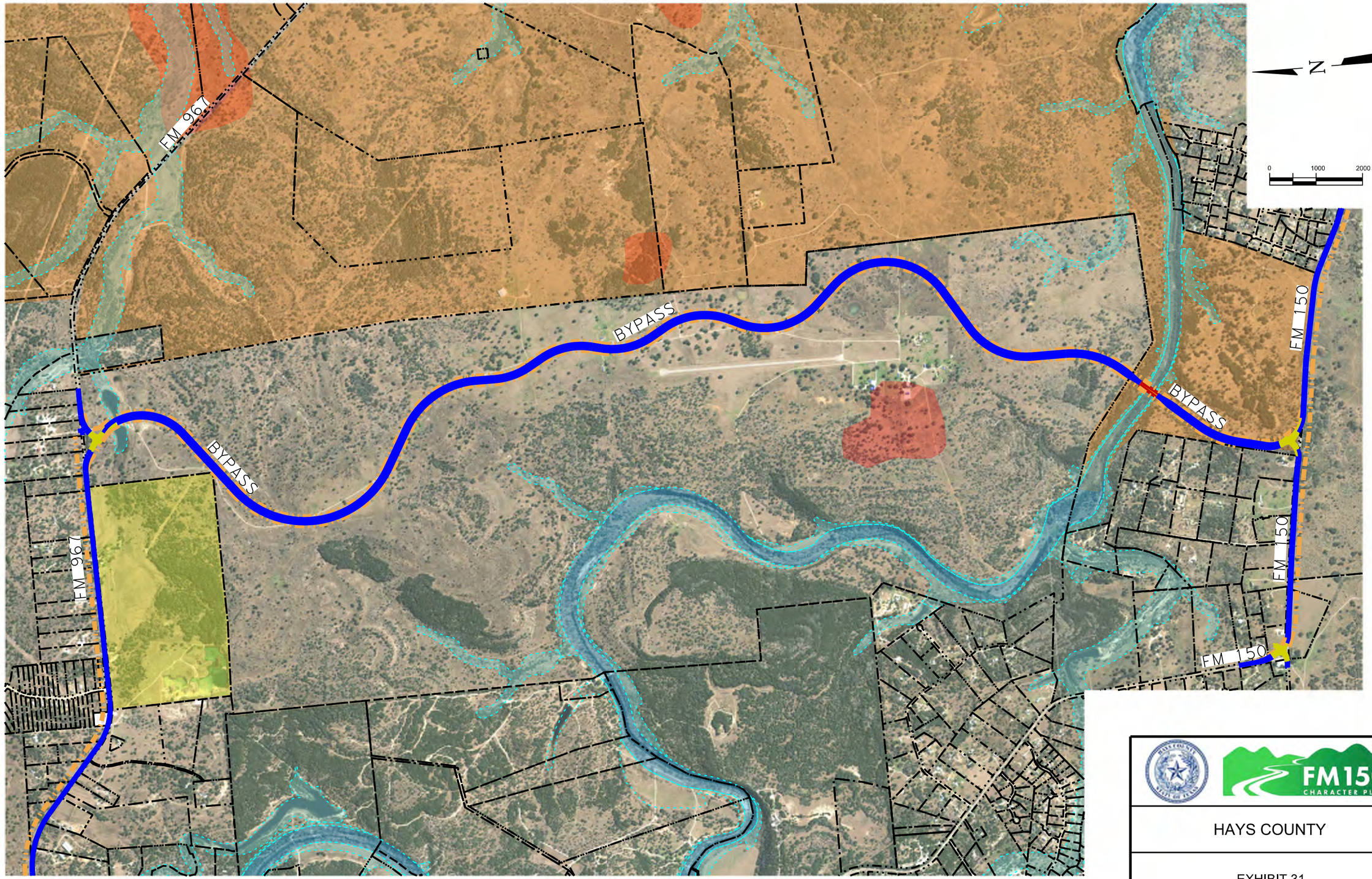


HAYS COUNTY

EXHIBIT 30
INTERSECTION OF FM 150/
PROPOSED BYPASS



HAYS COUNTY

EXHIBIT 31
BYPASS ALIGNMENT AND CURVES

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HAYS COUNTY

EXHIBIT 32
INTERSECTION OF FM 967/
PROPOSED BYPASS

Upgrade Sections

Preserving the existing segment of FM 150 between FM 3237 and FM 1826 by constructing the Bypass requires upgrading FM 967 and FM 1826 to maintain integrity of the corridor throughout the entire limits. There are two additional focus intersections in this segment in addition to FM 967 and Bypass intersection. These include intersections at FM 967 and FM 1826 and at FM 1826 and FM 150. Stop-controlled, signalized, and roundabout alternatives were presented at each location. The CAP preferred the roundabout alternative for the same reasons as at other described locations.

FM 967 Upgrade

This segment upgrades FM 967 from the Bypass intersection to FM 1826. FM 967 would remain rural and serve as a transition to the community zone on FM 1826. The intersection of FM 967/FM 1826 is shown in Exhibit 33. The alignment follows the existing roadway. The proposed cross-section widens the existing road to create two 12-foot lanes with 6-foot shoulders. This segment is identified as a rural zone and preserves a right-of-way corridor of 200-feet. The proposed typical section is shown in Exhibit 34.

Future evaluations of this segment will require special consideration of the eastern end of this segment. The property on the south side of FM 967 is in conservation through the Hill Country Conservancy. Federal funding was used in securing the conservation easement and any design plans for construction that affect this parcel will require environmental and regulatory review and approval.

Right-of-way preservation adjacent to the conservation property is shown to be entirely on the north side of the road. Such alignment would impact a single family residence and a Pedernales Electric Cooperative electrical substation.

FM 1826 Upgrade

This segment upgrades FM 1826 from FM 967 to FM 150. The intersection of FM 150/FM 1826 is shown in Exhibit 35. This segment is notable for being adjacent to the Driftwood community, including the Salt Lick and Camp Ben McCulloch land uses. This segment is proposed to be widened to two 11-foot lanes, a 14-foot center two-way left turn lane and 5-foot wide shoulders. Using curb and gutter could reduce the right-of-way footprint. Given the adjacent character and density of development, this segment is identified as a community zone, which preserves a right-of-way corridor of 150-feet. The typical section for this segment is shown in Exhibit 34.

FM 150 from FM 1826 to RM 12

The Phase I study identified community zones near the FM 150 intersections at FM 1826 and RM 12. The area between these two segments was designated as a rural zone. In Phase II, in keeping with the adjacent community's desire to have lower speeds through their community, the project team extended the community zone near FM 1826 further northeast around the curve. This provided other benefits to reduce proposed project impacts.

The section between FM 1826 and the Onion Creek crossing is a community zone. The segment from the Onion Creek crossing to RM 12 is designated as a rural zone with the designation transitioning to another community zone near RM 12. Phase I identified curve smoothing along various portions of this segment. Curve smoothing was identified as a means of decreasing the speed differential between the long, straight sections and the relatively small radius curves.

This segment includes focus intersections at Darden Hill Road and RM 12. Similar to other intersections, the CAP preferred roundabouts over conventional intersections. The intersection of FM 150/Darden Hill Road is shown in Exhibit 36. Lower speeds associated with the Darden Hill Road roundabout meant that the FM 150 alignment could include smaller radii approaching the intersection. This offered the following benefits while meeting the community desires to extend the community zone.

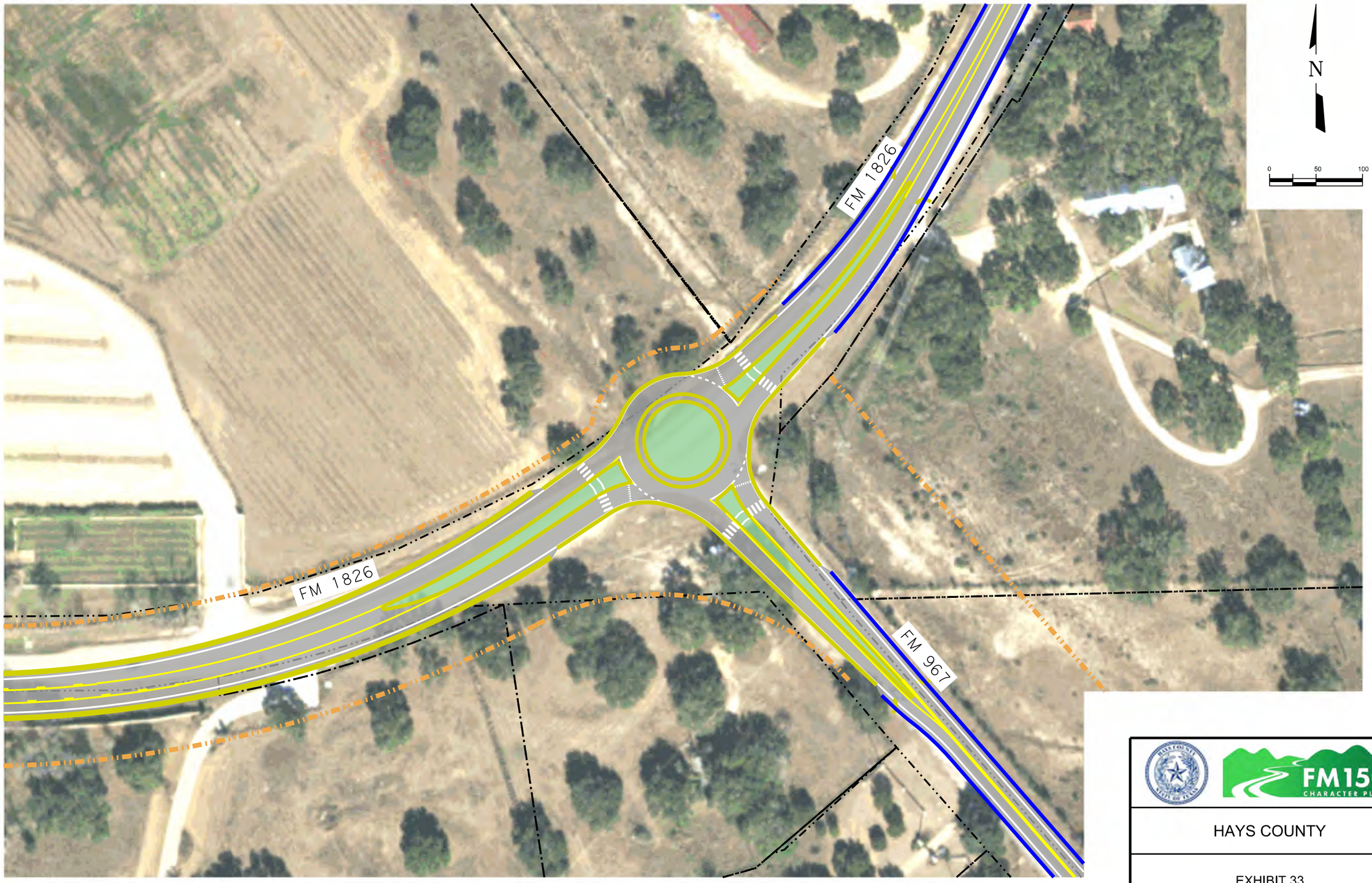
The lower speed of the community zone eliminates curve modifications in the vicinity of the Educated Roofing Systems (ERS) property. Developing a higher speed alignment near ERS would have required extensive excavation of the hill on the inside of that curve.

Phase I identified curve smoothing along the segment and in areas near the Onion Creek crossing. Based on engineering challenges from the Onion Creek bridge crossing and Darden Hill Road, the community zone was extended to include the area near the Onion Creek bridge.

Current bridge inspection reports and associated bridge ratings indicate several years of acceptable usage before reconstruction is required. In addition, the section between Onion Creek and Darden Hill Road contains several houses and driveways on one side and is in close proximity to Onion Creek on the other side. Smoothing curves to attain a design speed of 55 mph would impact the homes and/or the creek. Since speeds need to be reduced approaching the Darden Hill Road intersection, extending the community zone toward the Onion Creek bridge would allow more properties to be incorporated into the community zone.

The proposed roadway in this segment at the community zones consists of widening the existing roadway to two 11-foot lanes, a 14-foot center two-way left turn lane and 5-foot shoulders. The roadway would have curb and gutter with underground storm drainage in keeping with the community zone concept. The right-of-way preservation corridor for this zone is 150-feet. A typical section of this segment is shown in Exhibit 37.

The segment between Onion Creek and the approach to RM 12 is designated as a rural zone in keeping with the concept from Phase I. This segment includes widening the existing roadway to a section with two 12-foot lanes, a 14-foot center two-way left turn lane and 8-foot shoulders. There is no curb and gutter and drainage is accomplished with roadside ditches. The right-of-way corridor preservation for this segment is 200-feet in keeping with the rural zones elsewhere. A typical section of this segment is also shown in Exhibit 37.



FM150 CHARACTER PLAN

HAYS COUNTY

EXHIBIT 33
INTERSECTION OF FM 967/FM 1826

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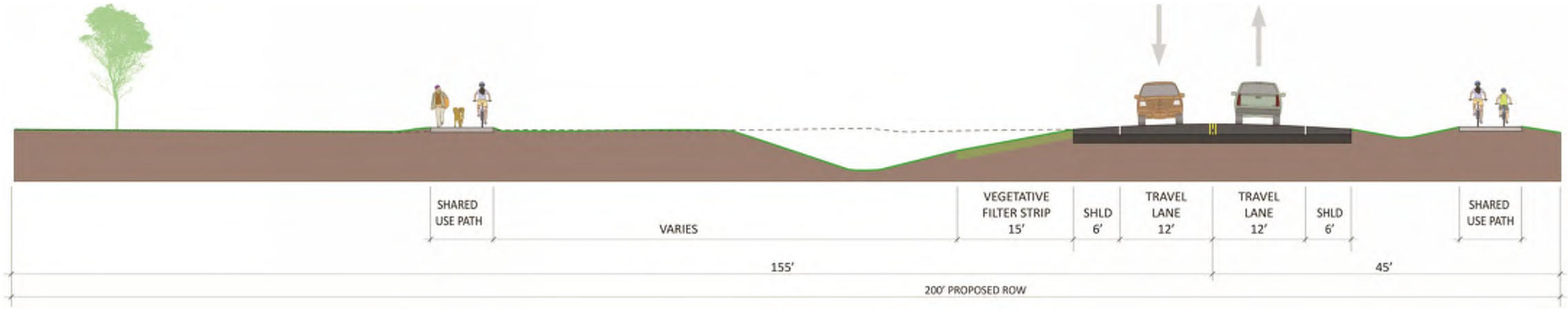


Exhibit 34. Typical Section FM 967 Upgrade (top) and FM 1826 Upgrade (bottom)

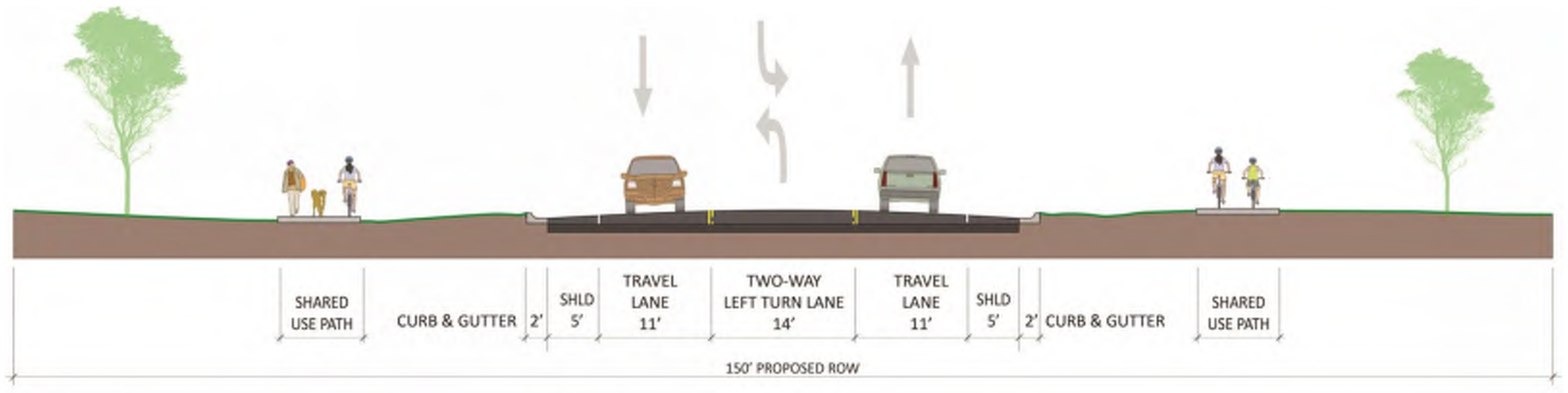
HAYS COUNTY

EXHIBIT 35
INTERSECTION OF FM 150/FM 1826

FM150 CHARACTER PLAN

HAYS COUNTY

EXHIBIT 36
INTERSECTION OF
FM 150/DARDEN HILL RD



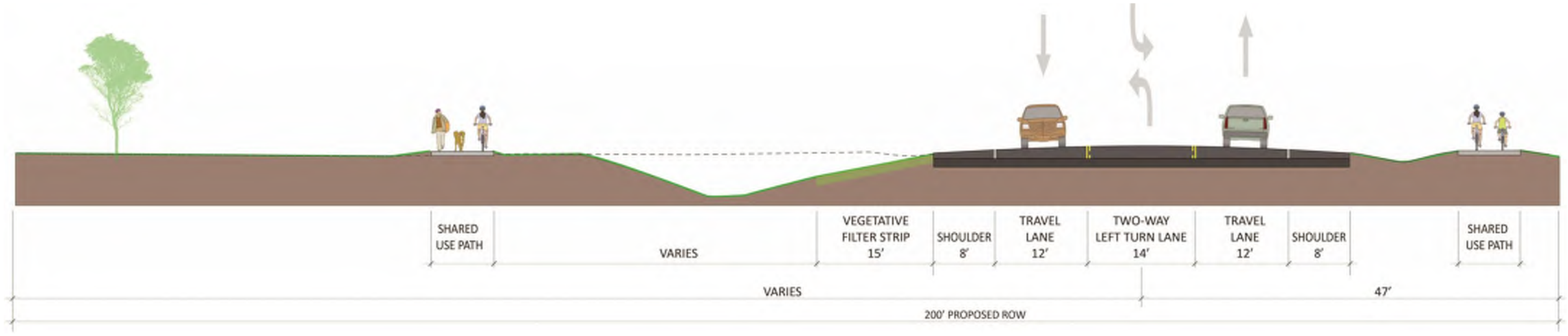


Exhibit 37. Typical Section FM 150 North Section Community Zone (top) and FM 150 North Section Rural Zone (bottom)

FM 150 from FM 3237 to FM 1826

During Phase I and as part of the development of the *Corridor Features and Themes Report*, the County, Technical Team, CAP and the community agreed that preserving the character of the section of FM 150 between FM 3237 to FM 1826 warranted a slightly different approach than other corridor segments. This agreement led to several other decisions and actions regarding this corridor segment.

First, as noted in the *Corridor Features and Themes Report*, project participants agreed that as long as the Bypass Section remained a viable option and as part of the final Master Plan, this existing section of FM 150 should remain as two lanes. Greater long-term FM 150 corridor capacity would be provided, if needed, through the Bypass Section.

Second, while it was agreed that this section of the FM 150 Corridor would remain two lanes, it was also agreed that some level of safety improvements are appropriate and would be determined as the funding arose. Future treatments to this section might include:

- Widening the existing shoulders to 4-8 feet to provide recovery areas;
- Curve smoothing to provide lower differentials in speeds between tangent sections and curves; and,
- Adding multimodal facilities (e.g., bikeways, sidewalks, pathways) to serve increasing non-motorized activity, particularly in and around Driftwood.

Third, after completing the *Corridor Features and Themes Report* and as the County and Technical Team transitioned toward this second phase of work and the completion of this Master Plan, the County had several conversations with TxDOT regarding the future ownership and responsibility for this section of FM 150. TxDOT has indicated it is willing to consider taking ownership and responsibility for the Bypass Section when and if it is built and, in turn, would give ownership of and responsibility for this section of FM 150 to the County.

These actions have enabled the County to phase the long-term planning for this section of FM 150 and let the community focus on establishing a framework for long-term FM 150 needs. This also allows the community to take the time it needs to provide additional and more detailed input into how it would like to see this section of FM 150 evolve under the possibility of County ownership and responsibility. As documented in Section 2, the Driftwood Historical Conservation Society (DHCS) was formed with a focus on preserving the Driftwood area. The DHCS worked with CAP members to develop the Driftwood Community signage for placement at participating properties along the roadway, shown in Exhibit 37.

Exhibit 38. Driftwood Community Signage
Developed in partnership with the CAP and the Driftwood Heritage Society

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SECTION 5 Next Steps

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5 NEXT STEPS

This Final Report and Master Plan is the second and final work product from the FM 150 West Character Plan Study. It represents the culmination of an almost three year effort by the County, working with the CAP, community members, and other stakeholders, to identify a menu of solutions that will be implemented over time to provide for the safe and efficient movement of traffic along the corridor while preserving its nature and character. Over time and as travel demand through and along the Corridor increases, these solutions and concepts will move into a more formal environmental review and design process. During these phases and as the projects move into implementation, the County will continue to work with TxDOT, the community, and other stakeholders to ensure that features and themes, context sensitive solutions, and other guiding principles identified through the planning process are incorporated and respected.

While this Master Plan identifies a series of concepts and solutions represented by preliminary planning alignments and intersection improvements, they are not provided within any specific priority or timeline. Although prescribing a specific priority and/or timeline might provide for a higher level of predictability, it lessens the amount of flexibility the County has in implementing the elements of the Plan. Given the continuing, but still evolving partnership between the County and TxDOT, the rate at which the County is growing, and the ever changing availability of federal and state funds available for transportation projects, maintaining flexibility will remain very important. However, it is anticipated that key intersection improvements (e.g., FM 150 and Darden Hill Road, FM 150 and FM 3237) could move forward before other preliminary roadway planning alignments are further developed.

When the County began the FM 150 West Character Plan Study it sought to do so through an open and transparent process that provided a variety of opportunities for the community to engage continually throughout the process. That goal was accomplished in the first phase of work that led to the development of the *Corridor Features and Themes Report*, which set the tone and precedent for how the community would be involved in future work on FM 150. That level of engagement continued through the second phase of work and led to the development of this Final Report and Master Plan. As the County moves the solutions and concepts described in this report toward project development and implementation, it remains committed to community involvement.

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SECTION 6 References

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6 REFERENCES

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