



El Paso County
Furrow Road Consultant Engineering Safety
Evaluation Project – From Highway 105 to Higby
Road

Safety Moment

Back to School:

Following a school bus:

- Increase following distance
- Watch for flashing lights
- Allow plenty of space for entry or exit

Driving in a school zone:

- Yield to pedestrians
- Watch for kids to appear in unexpected places
- Never block a crosswalk



Introductions

- El Paso County:
 - Chris Bland, P.E.
 - Joshua Palmer, P.E.



EL PASO COUNTY
PUBLIC WORKS

- Stantec Consulting Services:
 - Dave Krauth, P.E.
 - Brent Hypnarowski, E.I.T.



Agenda

1. Introductions
2. Agenda Review
3. Project Scope Recap
4. Traffic Volumes
5. Analysis Review
 - Results
 - Alternative Rankings
 - Recommendations
 - Concepts
6. Q & A

Project Scope

GOAL - Provide El Paso County with data and analysis to make an informed decision on solution(s) for issues raised by the neighborhood.

- Evaluate Existing and Future Traffic Operations*
 - Volumes, Crashes, Speeds, Operational Issues, Geometric Issues*
- Engage Residents – Two Public Meetings*
- Develop Recommendations of Treatments*
- Conceptual Design and Cost Estimating*
- Final Report*

Project Scope (cont.)

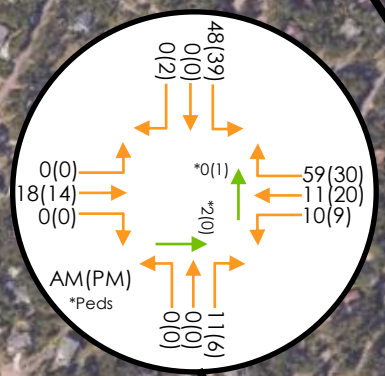
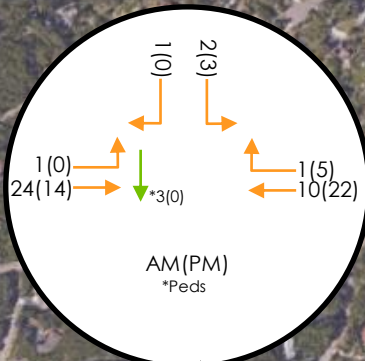
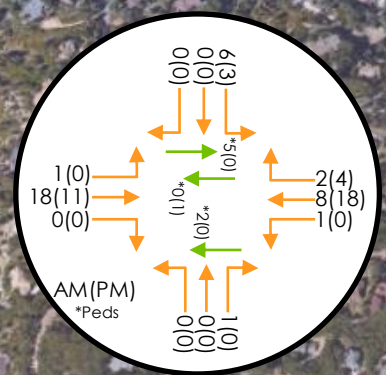
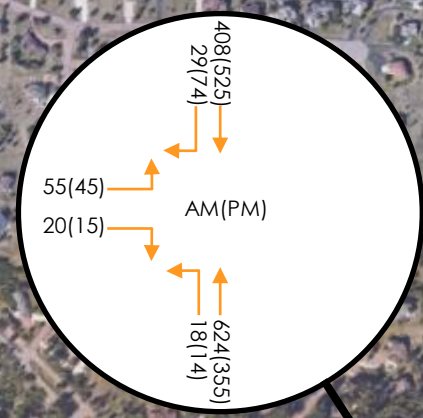
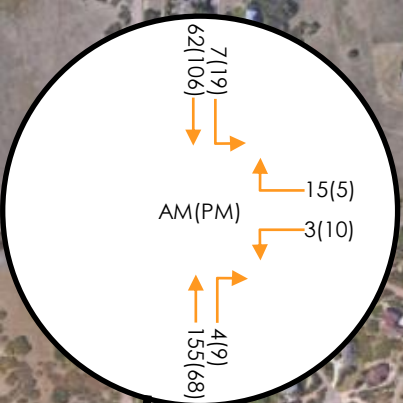
Issues
Neighborhood Concerns
Furrow Road used as a through corridor
Increase in vehicular speed through neighborhood
Impacts to roadway user safety
Deficiencies
Clear zone
Minimum Centerline Radius
Lane Width (greater than ECM)
Intersection / Driveway spacing
Intersection Sight Distance
Stopping Sight Distance

Traffic Volumes and Speeds

- Existing 2021 Volumes
 - 24-hour average daily traffic (ADT) and speed counts
 - 12-hour turning movement counts (TMC)
- Short-Term Volumes
 - Existing plus Grandwood Ranch Buildout Volumes
- Future 2040 Volumes

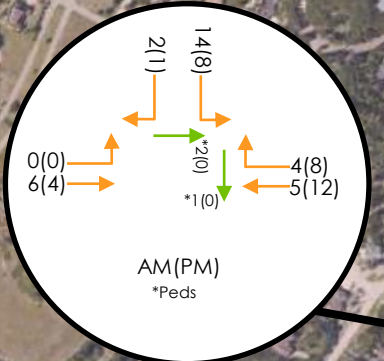


Fairplay Drive



Highway 105

Highby Road



Minglewood Trail S

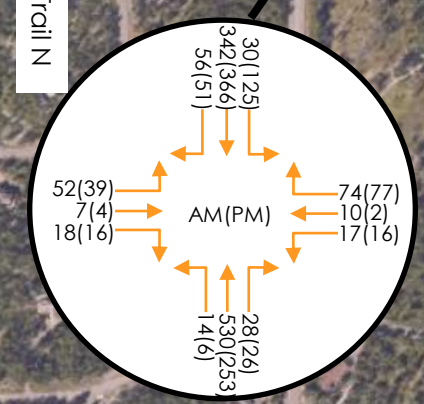
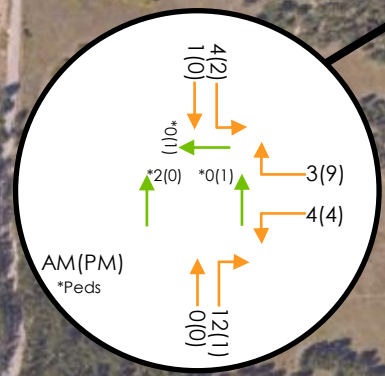
Lamplight Drive

Furrow Road

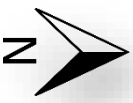
Metcalf Lane

Loverly Way

Minglewood Trail N



Existing Traffic



Fairplay Drive

ADT = 1,962
Speed Limit = 35 mph
85th Speed WB = 47 mph
85th Speed EB = 49 mph

ADT = 324
Speed Limit = 25 mph
85th Speed NB = 34 mph
85th Speed SB = 31 mph

ADT = 8,207
Speed Limit = 50 mph
85th Speed WB = 53 mph
85th Speed EB = 59 mph

Higby Road

Highway 105

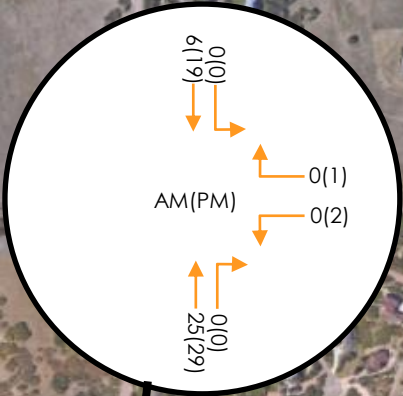
Furrow Road

Metcalf Lane

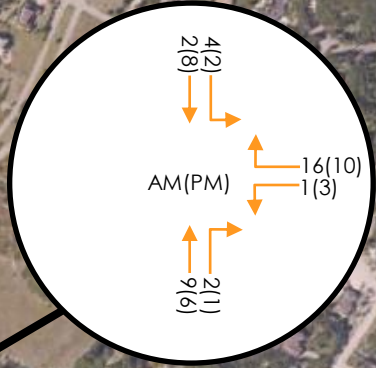
Existing ADT & 85th Percentile Speeds



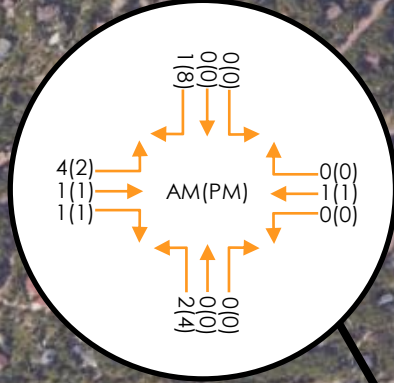
Fairplay Drive



Highby Road



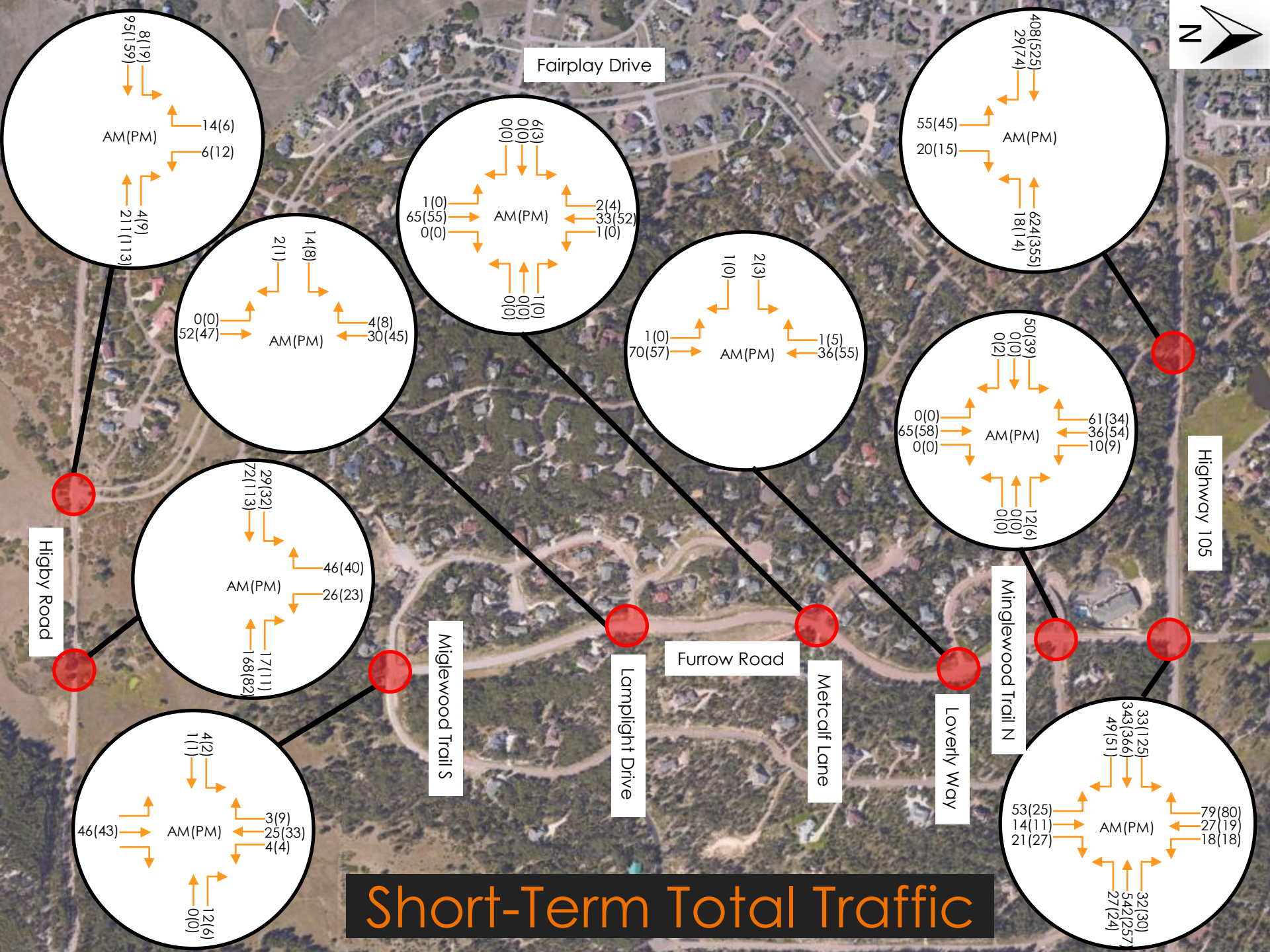
Furrow Road

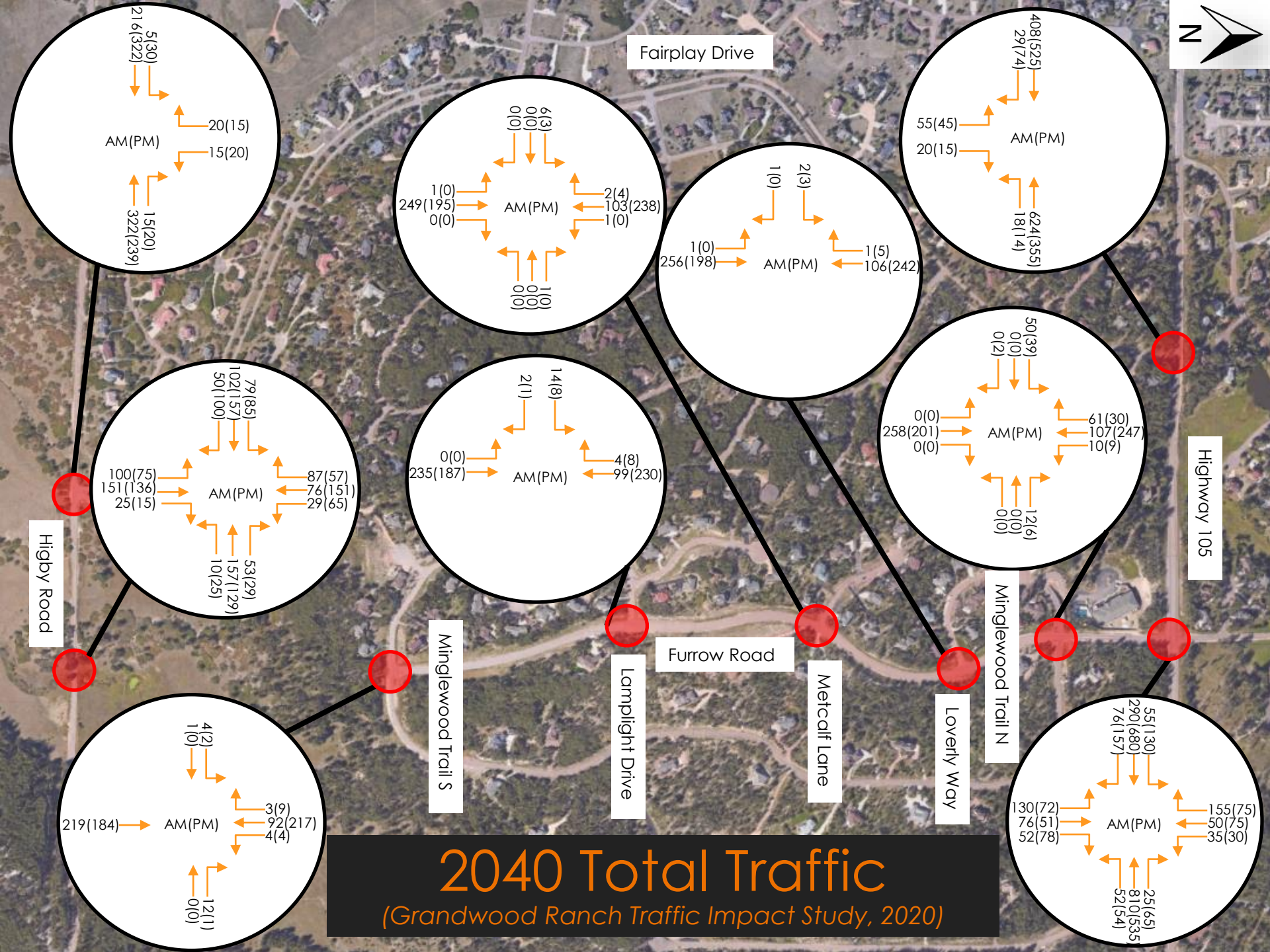


Highway 105

Short-Term Grandwood Trips

(Grandwood Ranch Traffic Impact Study, 2020)





2040 Total Traffic

(Grandwood Ranch Traffic Impact Study, 2020)

Crash Analysis

- 5-year crash history
- **Furrow Rd:** from Hwy 105 to Minglewood Tr S
- **Fairplay Dr:** from Hwy 105 to Higby Rd
- **Hwy 105:** from Jackson Creek Pkwy to 1 mile East of Furrow Rd
- **Higby Rd:** from Jackson Creek Pkwy to 1 mile East of Furrow Rd
- 0 recorded fatalities

Highway 105 Reported Crashes

2015-2019
(CDOT)



Intersection	Crash Type										Total Crashes
	Rear End		Broadside		Approach-Turn		Head-On		Fixed Object		
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
2nd Street									2	100%	2
3rd Street	1	50%	1	50%							2
Jackson Creek Parkway	13	81%	1	6%	1	6%	1	6%			16
Knollwood Boulevard	4	80%	1	20%							5

Higby Rd Reported Crashes

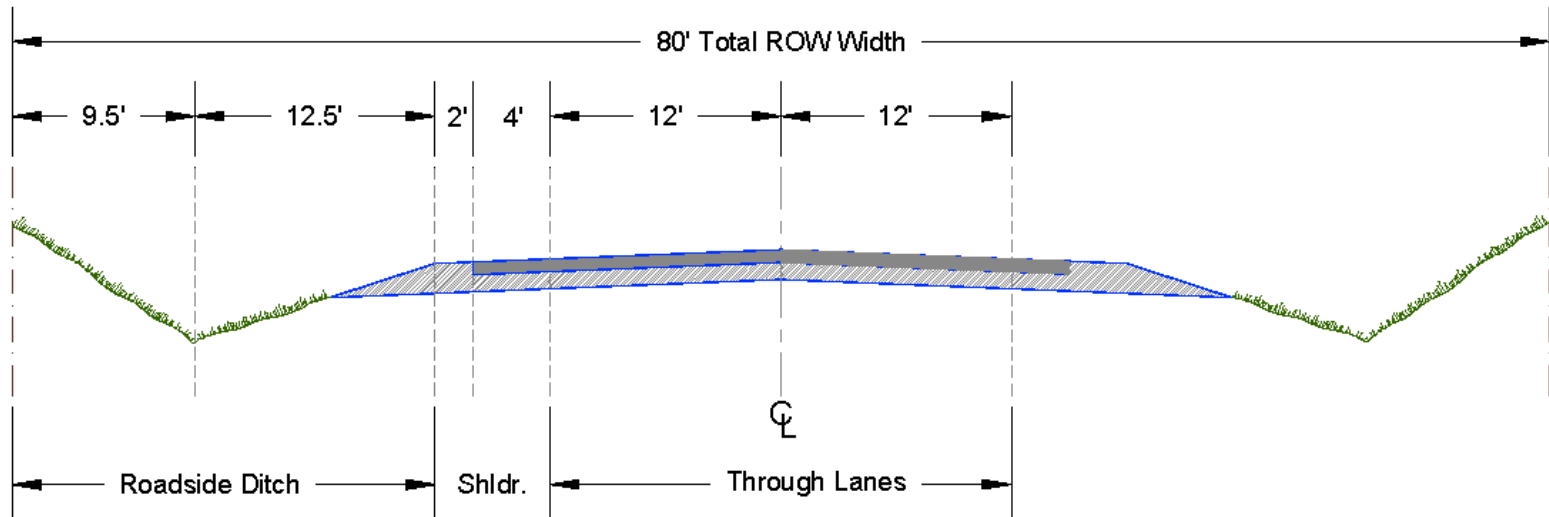
2015-2019
(CDOT)



Intersection	Crash Type										Total Crashes
	Rear End		Broadside		Head-On		Ped/Bicycle		Fixed Object		
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
Jackson Creek Parkway	7	50%	2	14%	2	14%	2	14%	1	7%	14
Fairplay Drive									1	100%	1

What is a Collector?

- Collector: “Roadways that serve as links between local access facilities and arterial facilities over medium-to-long distances, outside of or adjacent to subdivision developments. Collectors are managed to maximize the safe operation of through-movements and to distribute traffic to local access.” – *2016 Major Transportation Corridors Plan Update, El Paso County*



Alternatives Analysis

Initial List of Alternatives for Consideration

Modification/Treatment	Appropriate for Rural Collector	Cost *	Table 4 Recommended Alternatives Category
1. Designation of a corridor-wide speed limit	✓	\$	Recommendation
2. Correction of sight distance limitations	✓	\$\$/\$\$\$	Roundabouts, Recommendation
3. Continuous center two-way left turn lanes	✓	\$	Two-Way Left-Turn Lane
4. Urban cross-section with curb, gutter, and sidewalk	✓	\$\$\$\$	--
5. Pedestrian infrastructure, ramps, landing areas, and sidewalk	✓	\$\$\$	Multi-Use Path
6. Separate bicycle and pedestrian multi-use paths	✓	\$\$	Multi-Use Path
7. Designation of pedestrian crossings	✓	\$\$	Multi-Use Path
8. Raised median pedestrian refuge islands for pedestrian crossings	✓	\$\$	Multi-Use Path
9. Designation of separate bicycle lanes	✓	\$	Bike Lanes
10. Regulatory intersection traffic control signing, including two-way or all-way stop control	✓	\$	Traffic Signal, Roundabouts
11. Mini, compact, and single-lane roundabouts	✓	\$\$/\$\$\$	Roundabouts
12. MUTCD standard road signing	✓	\$	Recommendation
13. Chicanes	☒	--	--
14. Curb bump outs	✓	\$\$	--
15. Center median islands (with or without curbs)	✓	\$\$\$/\$\$	Center Median
16. Horizontal deflections	☒	--	--
17. Narrow travel lanes	✓	\$	Center Median, Two-Way Left-Turn Lane
18. Bike - pedestrian lanes	✓	\$\$	Multi-Use Path
19. Road Closure	✓	\$\$	Road Closure
20. Correction of curve radius deficiencies	✓	\$\$\$	Reduce Pavement Width
21. Correction of clear zone issues	✓	\$\$/\$\$\$	Reduce Pavement Width

* Costs are relative to the other alternatives being considered and are intended to account for the overall cost of the alternative: design, implementation, construction, operations and maintenance.

Signal Warrant

- Intersection of Highway 105 & Furrow Road
- Highway Capacity Software (HCS) used to evaluate 12-hour turning movement counts
- Short-term: Not Warranted
- Long-term (2040): Warranted

*This is being addressed in the Highway 105 study

All-Way Stop Control Warrant

- Thresholds:
 - 300 vehicles per hour along major approaches (NB + SB)
 - 200 vehicles per hour along minor approaches (EB + WB)
- Side Street Volumes (Daily Peak): **NOT WARRANTED**
 - Minglewood Trail N – 62 hourly vehicles along side street approaches
 - Lamplight Drive – 16 hourly vehicles along side street approaches
- Not anticipated that side street volumes will substantially grow based on lack of future build-out in these areas.
- “YIELD or STOP signs should not be used for speed control” – MUTCD, Section 2B.04

Roundabout Operation

- Roundabouts considered at Minglewood Trail N, Metcalf Lane and Minglewood Trail S
- Highway Capacity Manual (HCM) used to calculate capacity of a roundabout, based on flow rate
- Calculations only performed at Minglewood Trail N as this intersection has the highest number of entering vehicles
 - Based on HCM equations it is estimated that the roundabout can handle an approximate capacity of 1,000 vehicles per hour during the short-term scenario and 830 vehicles per hour during the long-term scenario
 - Existing counts show 178 hourly vehicles during the peak period for the combined northbound and southbound approaches – **APPROPRIATE TO CONSIDER**
- Assumed that if a roundabout works at this intersection, it will also work at the intersections with Metcalf Lane and Minglewood Trail S, where traffic volumes are lower

Alternative Rankings

Criterion	Intersections		Roadway			Ped/Bike		Other
	Roundabouts	Traffic Signal	Landscaped Median	Two-Way Left-Turn Lane	Reduce Pavement Width to 32'	Multi-Use Path	Bike Lanes	Maintain Road Closure
Safety	1	3	2	4	3	1	5	2
Cost	2	5	2	2	2	5	2	2
Environmental Impacts	2	5	1	2	1	2	2	4
Familiarity	2	4	1	4	1	3	5	1
User Convenience	3	5	2	2	1	1	4	5
Total Score	10	22	8	14	8	12	18	14

*Subjective scoring with 1 being the best and 5 being the worst

Preferred Alternative

- Do not open the extension of Furrow Road to Higby Road until the preferred alternative is in place with the following exception.
 - Opening of roadway should be considered should any of the following triggers occur:
 - Emergency access requirements
 - Connection to Gleneagle becomes imminent
 - MTCP notes need of connection by 2040
- Construct roundabouts at Minglewood Trail N and Metcalf Lane intersections.
 - Provides reduced speeds through the intersection
 - Improved safety (significantly less conflict points)
 - Discourages through traffic from using the roadway by breaking up the corridor
- Add a center median along the roadway, between roundabouts, with breaks at each side street. If this is not feasible due to physical constraints, reducing the overall width of the roadway by removing pavement on either side of the existing roadway should be pursued.
 - Effectively narrows the roadway to help reduce corridor speeds
 - Provides a buffer between northbound and southbound traffic, improving safety
 - Maintains residential feel which can discourage through traffic and encourages reduced speeds
- Provide MUTCD compliant roadway signage to include Keep Right signs for the medians at intersections, roundabout signage, Speed Limit 30 signing, and street name signs.

Secondary Alternative

- In addition to the preferred alternative, and depending on roadway alignment, construct an additional roundabout at Minglewood Trail S.
 - Provides reduced speeds through the intersection
 - Improved safety (significantly less conflict points)
 - Discourages through traffic from using the roadway by breaking up the corridor

Furrow Road & Minglewood Trail N – Roundabout Concept



Furrow Road & Metcalf Lane – Roundabout Concept



Furrow Road & Lamplight Drive – Roundabout Concept



Center Median Concept



Questions?

Please email El Paso County DOT:
Add “Furrow Road” in the subject line

DOTweb@elpasoco.com