

LSC Responses to TIS Redline Comments



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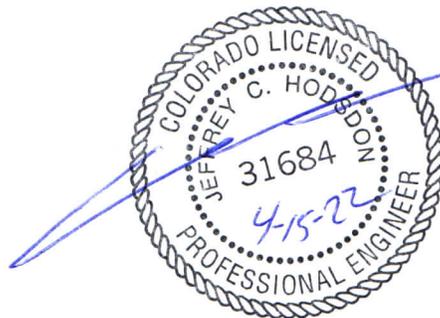
Falcon Meadows at Bent Grass Filing No. 3 Transportation memorandum (LSC #S214332) April 15, 2022

PCD File No
SF2216

Traffic Engineer's Statement

1

This traffic report and supporting information were prepared under my responsible charge and they comport with the standard of care. So far as is consistent with the standard of care, said report was prepared in general conformance with the criteria established by the County for traffic reports.



Developer's Statement

I, the Developer, have read and will comply with all commitments made on my behalf within this report.

Date

LSC Responses to TIS Redline Comments

Page: 1

 Number: 1 Author: Daniel Torres Subject: Text Box Date: 5/24/2022 11:13:09 PM

[PCD File No SF2216](#)

 Author: kdferrin Subject: Sticky Note Date: 6/24/2022 11:41:07 AM
LSC Response: The additional information has been added as requested

please revise to filing 3

1

Access

Two full-movement access points are proposed to the recently-completed section of Bent Grass Meadows Drive. Please refer to the attached site-plan exhibit. Figure 2 shows the location of the access points.

The two access points to Bent Grass Meadows Drive are part of Filing 2. Please revise the narrative to reflect that.

2

Sight Distance

Figure 3 shows a sight-distance analysis at the proposed access points to Bent Grass Meadows Drive. Based on a design speed of 40 miles per hour (mph) on Bent Grass Meadows Drive and the criteria contained in Table 2-21 of the *Engineering Criteria Manual (ECM)*, the required intersection sight distance at the proposed site-access points is 445 feet. The required stopping sight distance from *ECM* Table 2-17 is also shown in the figure. The required intersection sight distance and stopping sight distance can be met at both intersections if the areas between the sight-distance lines and the curb line have low-level landscaping and are kept free of other obstructions (such as monument signs and parking areas) that would restrict the drivers' line of sight. Landscaping should be low — about 18 inches or lower in height — to the east of the passenger-vehicle lines of sight shown. Please refer to *ECM* Sections 2.3.6.G.1 and 2.

Pedestrian Routes to Schools

- Woodmen and Meridian are shown as proposed bike routes on the *Major Transportation Corridors Plan (MTCP)* Non-Motorized Plan. Also shown is a proposed secondary regional trail west of the site.
- Bent Grass Meadows Drive is sufficiently wide for bicycles with the paved shoulder.
- There are developing pedestrian connections along the north side of the Woodmen North Frontage Road, Bent Grass Meadows Drive, and Meridian Park Drive. Other area sections of sidewalk/trail connections are being added as development occurs.
- Sidewalks have been added along Bent Grass Meadows Drive with the connection south to the frontage road, adjacent to the School District 49 headquarters.
- The subdivision streets will all have sidewalks to connect to the sidewalk along Bent Grass Meadows Drive.

EXISTING TRAFFIC CONDITIONS

Figure 4 shows the existing morning and afternoon peak-hour traffic volumes at the intersection of Woodmen Road/Golden Sage Road. The counts were counted in January 2020 and again in December 2020. The January 2020 counts were conducted prior to the completion of Bent Grass Meadows Drive between the Woodmen frontage road and Meridian Road, but before the restrictions due to the COVID-19 pandemic were put in place. Figure 4 shows the results of both the October 2018 counts and the October 2020 counts, as the more current counts were likely impacted by the COVID-19 pandemic. The traffic-count reports are attached.

☰ Number: 1 Author: Daniel Torres Subject: Callout Date: 5/24/2022 11:14:43 PM

please revise to filing 3

↩ Author: kdferrin Subject: Sticky Note Date: 6/24/2022 11:42:37 AM
LSC Response: Revised as requested

☰ Number: 2 Author: Daniel Torres Subject: Callout Date: 5/24/2022 11:20:38 PM

The two access points to Bent Grass Meadows Drive are part of Filing 2. Please revise the narrative to reflect that.

↩ Author: kdferrin Subject: Sticky Note Date: 6/24/2022 11:42:47 AM
LSC Response: Revised as requested

REQUIRED IMPROVEMENTS

Based on the projected short-term total traffic volumes from the PUD TIS, the classification of Bent Grass Meadows Drive as an Urban Non-Residential Collector, and the criteria contained in the *ECM*, right-turn deceleration lanes are **not** projected to be warranted on Bent Grass Meadows Drive approaching the site access points.

Based on the projected short-term total traffic volumes from the PUD TIS, the classification of Bent Grass Meadows Drive as an Urban Non-Residential Collector, and the criteria contained in the *ECM*, northeast-bound left-turn lanes are projected to be warranted on Bent Grass Meadows Drive approaching both site access points (Rowena Way and Henzlee Place). Bent Grass Meadows Drive has been constructed with a center two-way, left-turn lane that will meet these criteria.

Please see a copy of Table 4 Roadway System Improvements from the PUD TIS with annotations added in September 2021 (as part of the Filing 1 memo), March 2022 (as part of the Filing 2 memo), and April 2022 (for this memo) indicating the status of each improvement.

Regarding Improvement F, note that Bent Grass Meadows Drive has been completed between the Woodmen frontage road and Meridian Road since completion of the PUD TIS. The approved Filing 1 in Falcon Meadows at Bent Grass required construction, paving, and associated repairs to Bent Grass Meadows Drive south of the site, as deemed appropriate by the PCD Director and the County Engineer, including design and construction of an eastbound left-turn lane on Woodmen Frontage Road at Bent Grass Meadows Drive, if warranted, to meet the minimum standards of a Non-Residential Collector in accordance with the *Engineering Criteria Manual*. These road improvements may be eligible for cost recovery from adjacent developers.

Meeting were held with El Paso County PCD staff and City Traffic Engineering on March 14, 2022 and March 29, 2022 to discuss items G,H, I, and J in this table. The intersection is under city ownership/jurisdiction, however the ownership of the intersection of Golden Sage/N. Frontage Road is not clear. The city will be researching the ownership and the availability of potential additional ROW (if possible) to accommodate potential future alternative intersection options for the intersection of Golden Sage/N. Frontage Road and the approach legs to the south, east and west. It was determined that item item H would not be needed at this time. Item I would likely be needed in the short term, however, it was agreed that Falcon Meadows at Bent Grass would only be required to provide escrow towards this improvement for future construction once ownership and the availability of potential additional ROW is determined.

Regarding Improvement G, protected/permitted phasing has been added to the intersection of Golden Sage/Woodmen. This improvement is complete. ¹

Please provide an update to this. Has there been any new correspondence/meetings with the City. Also, Filing 2 indicated that if construction is needed it could wait till this (filing 3) filing. Is construction needed?

Number: 1 Author: Daniel Torres Subject: Cloud+ Date: 5/24/2022 11:31:01 PM

Please provide an update to this. Has there been any new correspondence/meetings with the City. Also, Filing 2 indicated that if construction is needed it could wait till this (filing 3) filing. Is construction needed?

Author: kdferrin Subject: Sticky Note Date: 6/24/2022 4:12:20 PM

LSC Response: LSC talked with City Traffic staff the week of June 20th and at this time, there are no updates to this information. The City would like the County collect the escrow for this and all future Falcon Meadows at Bent Grass filings and then give the money to the City for future improvements at Golden Sage/Woodmen & Golden Sage/N. Frontage Road.

Mr. Jim Byers

Falcon Meadows at Bent Grass Filing No. 2

Since the volume exceeds the threshold with this filing (it did not with filing 2) does the City still hold the position that it is not needed at this time. If so then please provide recent correspondence from the City.

Regarding Improvement H, the *Falcon Marketplace TIS Report Addendum* by LSC dated July 21, 2020 (PCD File No. SP-17-001/CDR-16-007) identified the trigger for the need to lengthen the current eastbound single left-turn deceleration lane on Woodmen Road approaching Golden Sage Road as when the eastbound left-turn volume is greater than 200 vehicles per hour (vph) during the afternoon peak hour. As shown in Figure 4, following buildout of Bent Grass Residential Filing No. 1 and Falcon Meadows at Bent Grass Filings Nos. 1, 2 and 3, the projected volume for this movement is 210 vph during the afternoon peak hour. However, it should be noted that our understanding is that control over the intersection of Golden Sage/Woodmen has been transferred to the City of Colorado Springs as part of the Banning Lewis Ranch North Annexation (CPC A 19-00022). The outcome of a meeting with the city was that item H would not be needed at this time.

Regarding Improvement I, the *Falcon Marketplace TIS Report Addendum* by LSC dated July 21, 2020 (PCD File No. SP-17-001/CDR-16-007) identified the trigger for the need to for an exclusive southbound right-turn deceleration lane on Golden Sage Road approaching Woodmen Road as when the southbound left-turn volume is greater than 167 to 192 vph during the morning peak hour. As shown in Figure 4, following buildout of Bent Grass Residential Filing No. 1 and Falcon Meadows at Bent Grass Filings Nos. 1, 2 and 3, the projected volume for this movement is 214 vph during the morning peak hour. This exceeds the estimated trigger identified that would require the construction of an exclusive southbound right-turn deceleration lane. However, recent analysis suggests that the existing laneage will accommodate Filing 3 traffic. Also note that control over the intersection of Golden Sage/Woodmen has transferred to the City of Colorado Springs as part of the Banning Lewis Ranch North Annexation (CPC A 19-00022). The outcome of meetings with the city was that escrow would be collected for improvement I for future construction once right-of-way and ownership issues are resolved.

Table 2 shows the percentage of the projected 2040 total traffic due to Falcon Meadows at Bent Grass Filing No 3 for Improvements H, I, and J. These percentages could be used to determine the pro-rata share of the cost of intersection improvements. However, it should be noted that control over the intersection of Golden Sage/Woodmen has been transferred to the City of Colorado Springs as part of the Banning Lewis Ranch North Annexation (CPC A 19-00022). Per the paragraph above, additional research is underway which will be helpful in determining a solution for Golden Sage/N. Frontage Road.

ROADWAY CLASSIFICATIONS

Figure 5 shows the recommended internal street classifications.

ROAD IMPROVEMENT FEE PROGRAM

Applicable fees will need to be paid to the Woodmen Road District pursuant to the agreement between El Paso County and the Woodmen Road District.

Number: 1 Author: Daniel Torres Subject: Callout Date: 5/24/2022 11:29:04 PM

Since the volume exceeds the threshold with this filing (it did not with filing 2) does the City still hold the position that it is not needed at this time. If so then please provide recent correspondence from the City.

Author: kdferrin Subject: Sticky Note Date: 6/24/2022 4:18:48 PM

LSC Response: LSC talked with City Traffic staff the week of June 20th and it is our understanding from that conversation, that City would like the County collect the escrow for this and all future Falcon Meadows at Bent Grass filings and then give the money to the City for future improvements at Golden Sage/Woodmen & Golden Sage/N. Frontage Road.

Taken from the Falcon Meadows at Bent Grass Updated Traffic Impact Study December 11, 2020 with Updates added in July 2021 and September 2021 and December 2021

Updated for Fil 2 March 2022.

Updated for Fil 3 April 2022.

Table 4
Roadway System Improvements
Falcon Meadows at Bent Grass

Description	Trigger	Timing	Responsibility		
Meridian Road/Bent Grass Meadows Road					
A	Signalize Meridian/Bent Grass Meadows	Remove existing stop-sign and replace with traffic signal control.	When warrant(s) are met – 2 of the 3 conditions of the "Crash Experience" warrant are currently met. The current number of reported crashes (susceptible to correction with a signal) exceeds the threshold as do the associated traffic volume thresholds.	With completion of the escrow agreement. This improvement has been completed	Bent Grass Metro District
B	Right-turn acceleration lane on Meridian at Bent Grass Meadows	ECM criteria has been exceeded. A deviation was previously approved waiving this requirement with the development of Bent Grass Residential Filing 1 and Bent Grass East Commercial Filing 2A. Additional development will either require the submittal and approval of a new deviation or construction of this improvement. (Notes: The installation of the traffic signal will regularly stop southbound traffic allowing eastbound right turns to enter southbound Meridian Road without an acceleration lane. The LOS analysis indicates significant improvement of the LOS with the signal. The crash data does not indicate a safety issue with the current eastbound right movement without the accel lane. Several costly improvements may be needed to build the accel lane -- including burying the overhead power lines south to Owl Place, reconstructing the ditch section along the west side of Meridian Road, and reworking the radius at Meridian Road. This intersection is similar to the Meridian/Woodmen Hills, Meridian/Stapleton, and Meridian/Londonary intersections to the north in that [or "to the extent that"] southbound right acceleration lanes have not been added. If the County ultimately wants a raised right-turn island on this southwest corner of the Bent Grass Meadows/Meridian Road intersection in conjunction with an accel lane, this would likely need to be accomplished later with the overall widening of Bent Grass Meadows just west of Meridian Road.	ECM criteria indicates the acceleration lane would need to be 960 feet long plus a 222-foot taper based on the design speed of 60 mph. Note that Owl Lane is located approximately 925 feet south of Bent Grass Meadows Drive. Therefore, the lane would be a continuous acceleration/deceleration lane between Bent Grass Meadows Drive and Owl Lane.	Accel lane and exp. This improvement has been completed	Bent Grass Metro District
Bent Grass Meadows Dr					
C	Construct Bent Grass Meadows Drive between the existing sections located north of the Woodmen frontage road and west of Meridian Road	Construct Bent Grass Meadows Drive as a Non-Residential Collector	With any development west of Bent Grass Residential Filing No. 1	This improvement has been completed	Improvements have been submitted to the County and is in the review process. Please update to reflect that.
D	Restrict westbound left-turn at 7-Eleven access	Restrict westbound left-turn at 7-Eleven access	This first final plat (Filing 1) in Falcon Meadows at Bent Grass shall require construction, paving and associated repairs to Bent Grass Meadows Drive south of the site, as deemed appropriate by the PCD Director and the County Engineer, including design and construction of an eastbound left turn lane on Woodmen Frontage Road at Bent Grass Meadows Drive if warranted, to meet the minimum standards of a Non-Residential Collector in accordance with the Engineering Criteria Manual. These road improvements may be eligible for cost recovery from adjacent developers.	With 50% percent development of Eas exp. This improvement has been completed	This section of Bent Grass Meadows has been constructed and opened. Improvement is likely currently warranted
E	Close 7-Eleven Access	Remove the existing cut-out.	Remove the existing cut-out.	With 50% percent development of Eas exp. This improvement has been completed	
Woodmen Frontage road/Bent Grass Meadows Dr					
F	Eastbound left-turn lane on Woodmen frontage road approaching Bent Grass Meadows Dr.	When the eastbound left-turn volume exceeds 25 vehicles per hour	When the eastbound left-turn volume exceeds 25 vehicles per hour	With the completion of Bent Grass Meadows Dr between the Woodmen Frontage road and Meridian Road	Bent Grass Metro District
Woodmen/Golden Sage					
G	Add protected/permitted phasing for left-turn movements	Prepare a traffic signal modification plan and furnish/install new traffic signal heads for protected-permissive phasing and other necessary hardware. Software needed to implement this phase; modify existing signal timing plan.	Table level of service/traffic volume to queue.	~Prior to the opening of the Bent Grass Meadows Boulevard to the public, signal modification plans should be prepared, and coordination with EPC DPW (and possibly the City of Colorado Springs) will be necessary. (Note: A future implementation of this left turn phase. Steps should be taken such that the phase can be implemented shortly after it has been determined that it should be implemented. This determination would be made by monitoring the traffic volumes and operations once Bent Grass Meadows Drive connection is opened to traffic to determine if the phase should be added at that time.	Applicant. These road improvements may be eligible for cost recovery from adjacent developers.
H	Lengthening of the current eastbound single left-turn deceleration lane on Woodmen approaching Golden Sage Road	Provide a 240-foot transition taper (20:1 taper ratio), 290 feet of deceleration distance plus sufficient vehicle stacking distance. CURRENT: 175-foot taper plus a 465-foot left-turn lane which translates to a 175-foot taper, 290-foot deceleration distance, and 175 feet of stacking distance. SHORT TERM: Adequate stacking is available in the current turn lane - calculated queue length 204 feet. LONG TERM: Lengthen single left-turn lane and/or future implementation of dual left-turn lanes (if capacity needs dictate). If a dual left is implemented in the future, consideration will need to be given to the configuration on Golden Sage and at the Golden Sage/Woodmen Frontage Road intersection to receive the dual left-turn pavement.	The estimated "trigger" of 40 PM peak hour eastbound left turns above the estimated short term total volume (from Figure 16a of the TIS) approximately translates to and additional 589 directional ADT for residential trips making this turning movement (based on the ITE single family trip ratio). This estimated threshold may be reached with a combination of site-generated trips and background trips.	12/2/2021 See Note 2 below Not anticipated with Filing No. 1 (4/6/2022) Please refer to Note 2 below and report narrative.	Bent Grass Metro District - pro-rata share (based on total traffic volumes) of the cost of the improvement. (Note: Other potential responsibility for participation: In addition to the yet-to-be developed properties within the Bent Grass Metro District service area and the Falcon Marketplace development, other future developers of currently vacant land within the "travel shed" of the north leg (and potentially the south leg) of the Golden Sage/Woodmen N. Frontage Road intersection may also be assigned as responsible participants in future or completed (if a cost recovery agreement is put in place) traffic/roadway improvements.
I	Southbound exclusive right-turn lane on Golden Sage Road approaching Woodmen Road	A continuous right-turn lane within the 150 feet between the Woodmen Frontage Road and Woodmen Road	The estimated "trigger" of 5:30 AM peak hour southbound right turns above the estimated short term total volume (from Figure 16a of the TIS) approximately translates to an additional 8510 directional ADT for residential trips making this turning movement (based on the ITE single family trip ratio). This estimated threshold may be reached with a combination of site-generated trips and background trips.	12/2/2021 See Note 2 below Not anticipated with Filing No. 1 (4/6/2022) Please refer to Note 2 below and report narrative.	Bent Grass Metro District - pro-rata share (based on total traffic volumes) of the cost of the improvement. (Note: Other potential responsibility for participation: In addition to the yet-to-be developed properties within the Bent Grass Metro District service area and the Falcon Marketplace development, other future developers of currently vacant land within the "travel shed" of the north leg (and potentially the south leg) of the Golden Sage/Woodmen N. Frontage Road intersection may also be assigned as responsible participants in future or completed (if a cost recovery agreement is put in place) traffic/roadway improvements.
J	Signalization of Golden Sage Road/Woodmen Frontage Road or reconstruction as a modern roundabout. Future additional laneage may be necessary at this intersection to accommodate vehicle queues and for traffic operations.	Remove existing stop-signs and replace with traffic signal control or reconstruct as modern roundabout	When needed to maintain acceptable level of service/traffic operations and/or to control vehicle queues. Fair-share participation by the development or the district on behalf of the district members.	12/2/2021 See Note 2 below Not anticipated with Filing No. 1 (12/2/2021) Not anticipated with Filing No. 2	Bent Grass Metro District - pro-rata share (based on total traffic volumes) of the cost of the improvement. (Note: Other potential responsibility for participation: In addition to the yet-to-be developed properties within the Bent Grass Metro District service area and the Falcon Marketplace development, other future developers of currently vacant land within the "travel shed" of the north leg (and potentially the south leg) of the Golden Sage/Woodmen N. Frontage Road intersection may also be assigned as responsible participants in future or completed (if a cost recovery agreement is put in place) traffic/roadway improvements.

(1) See Table 5 for pro-rata percentage calculations

Source: LSC Transportation Consultants, Inc. (December 2020)

(2) April 2022 Note: Meetings were held with El Paso County PCD staff and City Traffic Engineering on March 14, 2022 and March 29, 2022 to discuss items G, H, I, and J in this table. The intersection is under city ownership/jurisdiction, however the ownership of the intersection of Golden Sage/N. Frontage Road is not clear. The city will be researching the ownership and the availability of potential additional ROW (if possible) to accommodate potential future alternative intersection options for the intersection of Golden Sage/N. Frontage Road and the approach legs to the south, east and west. Item G has been completed. Item H would not be needed at this time. Item I will likely be needed in the short term, however only an escrow will be required with Filing 3, as the research of the Golden Sage/N. Frontage Road is ongoing.

(3) See attached Falcon Marketplace TIS Report Addendum dated July 21, 2020 (PCD File Nos. SP-07-001 and CDR-16-007).

Number: 1 Author: kdferrin Subject: Callout Date: 4/6/2022 2:05:10 PM

Updated for Fil 2 March 2022.

Number: 2 Author: kdferrin Subject: Text Box Date: 3/18/2022 5:36:17 PM

Taken from the *Falcon Meadows at Bent Grass Updated Traffic Impact Study* December 11, 2020 with Updates added in July 2021 and September 2021 and December 2021

Number: 3 Author: kdferrin Subject: Polygon Date: 11/29/2021 2:22:40 PM -06'00'

Number: 4 Author: kdferrin Subject: Text Box Date: 4/6/2022 2:11:48 PM

Updated for Fil 3 April 2022.

Number: 5 Author: kdferrin Subject: Text Box Date: 9/28/2021 3:35:07 PM

This improvement has been completed

Number: 6 Author: kdferrin Subject: Text Box Date: 9/28/2021 3:34:56 PM

This improvement has been completed

Number: 7 Author: Daniel Torres Subject: Callout Date: 5/24/2022 11:37:47 PM

It is my understanding that the eastbound left turn lane improvements have been submitted to the County and is in the review process. Please update to reflect that

Author: kdferrin Subject: Sticky Note Date: 6/24/2022 11:47:52 AM

LSC Response: See the second note for this box (identified in magenta). The first note has been removed in the updated TIS to avoid confusion

Number: 8 Author: kdferrin Subject: Text Box Date: 3/19/2021 9:19:30 AM

This improvement has been completed

Number: 9 Author: kdferrin Subject: Polygon Date: 6/24/2022 11:47:30 AM

Number: 10 Author: kdferrin Subject: Callout Date: 9/28/2021 5:31:49 PM

This first final plat (Filing 1) in Falcon Meadows at Bent Grass shall require construction, paving and associated repairs to Bent Grass Meadows Drive south of the site, as deemed appropriate by the PCD Director and the County Engineer, including design and construction of an eastbound left turn lane on Woodmen Frontage Road at Bent Grass Meadows Drive if warranted, to meet the minimum standards of a Non-Residential Collector in accordance with the Engineering Criteria Manual. These road improvements may be eligible for cost recovery from adjacent developers.

Number: 11 Author: kdferrin Subject: Text Box Date: 3/19/2021 9:19:41 AM

This improvement has been completed

Number: 12 Author: kdferrin Subject: Callout Date: 9/28/2021 3:44:52 PM

Construction, paving and associated repairs to Bent Grass Meadows Drive south of the site, as deemed appropriate by the PCD Director and the County Engineer. Including design and construction of an...

Number: 13 Author: kdferrin Subject: Callout Date: 9/28/2021 5:32:20 PM

This section of Bent Grass Meadows has been constructed and opened Improvement F is likely currently warranted

Number: 14 Author: kdferrin Subject: Text Box Date: 3/19/2021 9:33:47 AM

This improvement has been completed

Number: 15 Author: kdferrin Subject: Highlight Date: 3/19/2021 9:34:15 AM

Number: 16 Author: kdferrin Subject: Callout Date: 9/28/2021 5:32:26 PM

Applicant. These road improvements may be eligible for cost recovery from adjacent developers.

Number: 17 Author: kdferrin Subject: Text Box Date: 4/18/2022 6:05:54 AM

This improvement has been completed
(note added: 4/6/2022)

Number: 18 Author: jchodsdon Subject: Polygon Date: 12/2/2021 11:02:55 AM -06'00'

Number: 19 Author: jchodsdon Subject: Text Box Date: 12/2/2021 11:03:53 AM -06'00'

12/2/2021