

January 4, 2022

Mr. Rick Dorn
Dorn Real Estate and Development
PO Box 81524
Billings, MT 59108

Reference: Traffic Engineering Conceptual Level Analysis
Project No. 12004 – COS 2828

Dear Mr. Dorn:

The purpose of this letter is to provide a preliminary traffic impact analysis for the COS 2828 development, south of Bell Drive and west of Shiloh Road in Billings, Yellowstone County, Montana. The location and proposed layout for the COS 2828 development is illustrated in the attached figure. The development is located southwest of the Bell Avenue/Shiloh Road intersection and the concept plan includes an estimated 408 multifamily units and 26 duplex units. The development is anticipated to be fully built out and occupied by 2026.

Traffic Conditions

Traffic counts were collected on Thursday, December 16, 2021. Raw count data was adjusted for seasonal variation using City of Billings seasonal adjustment factors. An accurate estimate of site-generated traffic must be made to analyze the impacts of a new development. This study utilized Trip Generation, 11th Edition, published by the Institute of Transportation Engineers (ITE), which is the most widely accepted source for determining trip generation projections.

Trip generation projections provide an estimate of the total number of trips that would be generated by a proposed development. However, in order to estimate the net number of new trips made by personal vehicles external to the site, adjustments must often be made to account for internal capture trips, pass-by trips, and trips made by alternate modes. Internal capture (IC) trips are those trips that do not have origins or destinations external to a project site. Since IC trips occur internally, they do not have an impact on external traffic operations. IC trips most often occur in mixed-use developments where residential, commercial, and office-related land uses exhibit a high rate of internal trip exchange. Pass-by trips are those trips that are made as intermediate stops on the way from a point of origin to a primary trip destination. Pass-by trips are attracted from traffic “passing by” on an adjacent street that offers direct access to the site. They are primarily attracted by commercial type land uses such as restaurants, convenience markets, and gas stations. No pass-by or internal capture trips were included for this development.

A percentage of trips generated could be made by alternate modes (walking, biking or transit), as there is a multi-use path along Shiloh Road and anticipated sidewalk throughout the development. However, alternate mode trips external to the site were conservatively considered to be negligible for this analysis. In total the COS 2828 development is projected to generate 2,937 new external

vehicular trips on a typical weekday including 175 trips (43 entering/32 exiting) during the AM peak hour and 223 trips (140 entering/83 exiting) during the PM peak hour.

Land Use	Independent Variable		Average Weekday			AM Peak Hour			PM Peak Hour		
	Intensity	Units	total	enter	exit	total	enter	exit	total	enter	exit
Single-Family Attached Housing ¹	26	Dwelling Units	187	93	94	12	4	8	15	9	6
Multifamily Housing (Low-Rise) ²	408	Dwelling Units	2750	1375	1375	163	39	124	208	131	77
Total New External Trips			2937	1468	1469	175	43	132	223	140	83

- (1) Single-Family Attached Housing - Land Use Code 215*
 Average Weekday
 Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM:
 Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM:

Units = Dwelling Units
 Average Rate = 7.20 (50% entering, 50% exiting)
 Average Rate = 0.48 (31% entering, 69% exiting)
 Average Rate = 0.57 (57% entering, 43% exiting)

- (2) Multifamily Housing (Low-Rise - Land Use Code 220*
 Average Weekday
 Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM:
 Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM:

Units = Dwelling Units
 Average Rate = 6.74 (50% entering, 50% exiting)
 Average Rate = 0.40 (24% entering, 76% exiting)
 Average Rate = 0.51 (63% entering, 37% exiting)

**Trip Generation, 11th Edition*, Institute of Transportation Engineers, 2017

***Trip Generation Handbook, 3rd Edition*, Institute of Transportation Engineers, 2017

Trip distribution is an estimate of the routes that site-generated trips will utilize to travel to and from the site, typically expressed on a percentage basis. For this update, Sanderson Stewart reviewed 2020 and 2021 annual daily traffic volumes (ADT) and calculated an updated distribution. Internal site distributions were determined based on proximity to nearest site access and most direct route to the trip's destination. It was assumed through engineering judgement that approximately 8% of total site egress traffic, primarily generated from the northern portion of the site, with a final destination east/west on Central Avenue or north on Shiloh Road would find routes through the residential neighborhoods to access Central Avenue from Bell Avenue with the remaining total site egress traffic using Bell Avenue, Shiloh Road, and Monad Road for access to their final destination. Ingress traffic for this portion of the site would access via Bell Avenue. The southern portion of the site was assumed to all access Monad Road for ingress and egress.

For the purposes of this study, it was assumed that the COS 2828 development will be built out by 2026. Traffic volume projections for the Bell/Shiloh intersection were calculated for the horizon year using an average background growth rate of 2.5 percent per year, consistent with recent traffic studies in the area. Existing and Future capacity analyses for the Bell/Shiloh intersection was calculated using Highway Capacity Software (HCS7) for stop-controlled intersection. The results of the existing and future conditions analysis showed that all study area intersections currently operate at LOS C or better. The existing and future conditions were modeled as stop-controlled.

Conclusions and Recommendations

The preceding analysis has shown that the COS 2828 development will generate a combine 2,937 (half ingress and half egress) trips daily. With the new external trips added to the surrounding roadway network, the Bell/Shiloh intersection is projected to operate at LOS C or better with existing traffic control. Bell Avenue is anticipated to have an increase of 807 westbound and 231 eastbound new daily site generated trips until further connections to the west are constructed. The

City of Billings Functional Classification Map shows a proposed future collector roadway from Central Avenue at approximately 44th Street West, south to Bell Avenue.

It is anticipated that approximately 116 daily trips (egress from proposed site) will route from Bell Avenue north to Central Avenue through the residential neighborhoods. Currently, Legends Way is the only public roadway between Central Avenue and Bell Avenue. Private roadways (Twin Pines Way and Bonaventure Drive) could implement additional measures (additional signage, enforcement, and/or speed bumps) to deter traffic.

Sincerely,



Joey Staszczuk, PE, PTOE
Senior Transportation Engineer | Community Transportation Studio Manager

JHS/gc
Attachments

P:12004_01_04_2022_Dom_Bell_Traffic_Letter



[7324]
{148}

CENTRAL AVE

[14669]
{1027}

[8355]
{148}

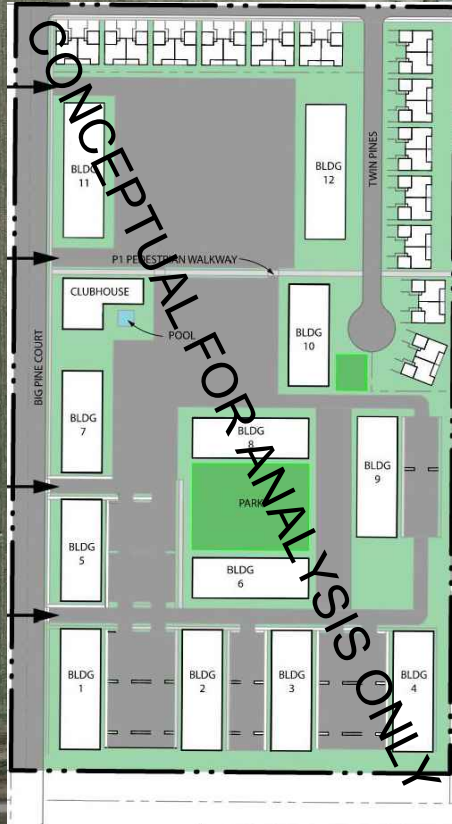
LEGENDS WAY

↓ ↑
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BELL AVE

{807} ←
(231) →

SHILOH RD



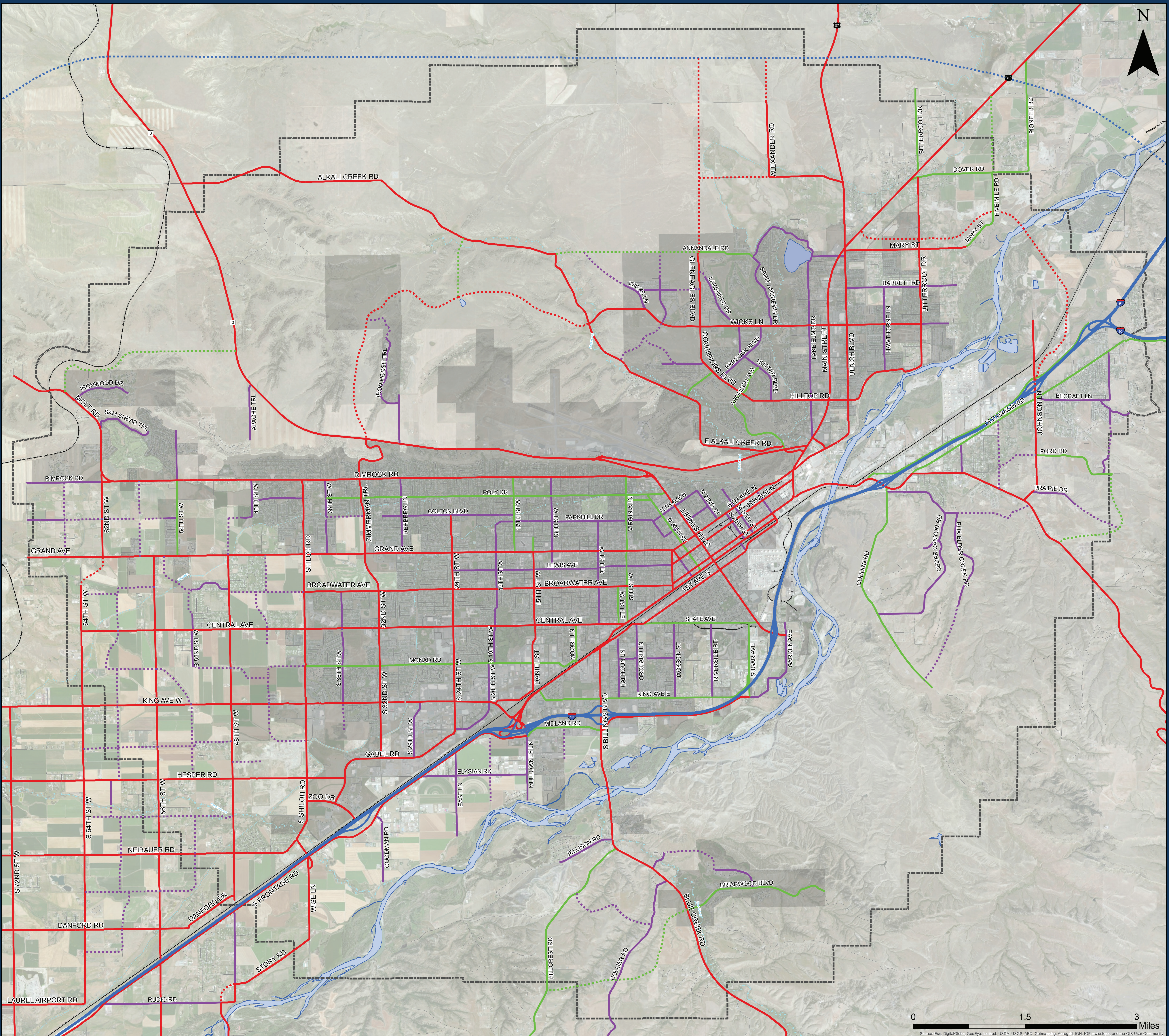
MONAD RD

{661} ←
{1122} →

[3804]
{587}

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KEY
XX — AM Peak Hour
(XX) — PM Peak Hour
[XX] — 2020 AADT
{XX} — Daily Site Trips



<p>Proposed Roadway Functional Classification</p> <ul style="list-style-type: none"> ••••• Proposed Controlled Access ••••• Proposed Principal Arterial ••••• Proposed Minor Arterial ••••• Proposed Collector 	<p>Existing Roadway Functional Classification</p> <ul style="list-style-type: none"> — Interstate — Principal Arterial — Minor Arterial — Collector — Local Streets 	<ul style="list-style-type: none"> — Railroads ■ Billings □ Study Area
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Note: Functional Classification System for local transportation planning purposes, this map may not be consistent with the Federally approved functional classification network. Updated on June 24th, 2014

Functional Classification Map



BILLINGS - YELLOWSTONE COUNTY

