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From:	Joe Bessman, PE
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This memorandum provides a response and supplemental information to address transportation concerns and questions raised at the August 28, 2017 Planning Commission hearing.

TRAFFIC COUNTS

One of the primary questions raised at the Planning Commission meeting was related to the timing of the traffic counts. Concerns were raised by members of the Planning Commission and the public about the timing of the counts, and specifically whether they included the impacts of school trips. Typically, seasonal adjustments are only applied to regional facilities (highways), as trips within urban areas are relatively stable throughout the year. Further, the timing of a land use application often dictates when traffic counts can be collected. Traffic counts are not intended to reflect peak conditions, but a “typical” or representative condition for the area.

On the regional facilities within Central Oregon (OR 126, US 97) the peak seasonal period occurs during the summer months (July and August), when home occupancy rates and tourism are at their peak. The study area includes locations along Business 97 and the OR 126 corridor, but also includes the areas immediately surrounding the site (such as NW Northwest Way, Maple Avenue, and 19th Street) that experience different peaks than the highway system related to agricultural or school peaks.

Traffic counts can also vary by day of week. Within the City of Redmond (and throughout the Central Oregon region), traffic studies focus on the midweek Tuesday through Thursday commute period between 4:00 and 6:00 p.m. This period is when area traffic volumes are typically at their peak due to commute, dining, and shopping trips on area roadways.

Traffic counts for the Dry Canyon PUD were collected throughout the study area on May 17, 2017. These were collected while area schools were in session, and reflect seasonally-higher travel volumes of late spring. These traffic counts showed relatively low traffic volumes for the surrounding facility classifications, which is due to the rural farming and undeveloped areas that surround the property.

To respond to a request for an expanded study area, additional traffic counts were collected on August 9, 2017. These counts include locations along the 35th Street corridor and the NW Spruce Avenue/NW 19th Avenue intersection. As the traffic operates well within acceptable City standards (Level of Service “A” and “B”) the impacts of schools would not change any of the findings or recommendations.

PARKING PROVISIONS

Concerns were raised during the hearing related to parking accommodations with the narrower lots and higher densities. This section describes typical block layouts to address these concerns. Further discussion of typical street sections will be provided under separate cover detailing the available on-street parking options within various portions of the site.

Townhome Development

Concerns were raised by the Planning Commission related to parking demands within the townhome lots, particularly with the narrow frontage of the lots. To further clarify the design of these blocks, sample templates were prepared. These illustrate the planned resident and visitor parking areas, as shown in Figure 1. This shows that a two-way private alley is proposed behind the townhomes for access to the garages, leaving the entire street frontage and sides of the block available for temporary visitor parking (homeowner parking will be restricted by the CC&Rs). The lot depth allows an adequate driveway to fit standard vehicles (Ford Expedition or smaller). The 20-foot alley width can also accommodate emergency and service vehicles. The length of the townhome lots provides additional garage space on the lower level for storage of personal belongings.



Figure 1. Sample Townhome Layout.

Single Family Detached Homes Development

Detached single family home sites are provided with longer and wider driveways to accommodate a larger average family size. While the curvature of the roadways within the Dry Canyon PUD results in varied lot shapes and sizes, a typical block sample with 5,000 square-foot lots is provided in Figure 2 to illustrate the relative street frontage available for parking. Staggering of driveways can provide additional space for longer vehicles between residences.



Figure 2. Typical single family detached residential block.

NEIGHBORHOOD TRAFFIC CALMING

City Policies and Guidance

Page 9-10 of the City TSP provides guidance related to local street volumes, and states that these facilities should not exceed 1,200 daily trips. This equates to a local street serving no more than approximately 120 homes. In addition, residential neighborhoods should not experience speeds greater than 30-35 miles per hour, and a development project should not increase volumes by 25 or more peak hour trips (approximately 250 daily trips). In cases where this occurs, Table 9-2 presents a list of potential traffic calming measures that could be applied.

Area Context and Control Review

The Dry Canyon PUD is located immediately west of the Echo Rim and Sterling Pointe neighborhoods, and within the area street connectivity to the east is severed by the Dry Canyon forcing all traffic onto the Maple Avenue corridor. Nearly all essential services are currently provided to the south and east, and while the NAP identifies lands for supporting schools and commercial services along the NW Northwest Way corridor in the future, these uses are not yet planned.

The primary roadway connection within the area to serve the new neighborhood is the NW Northwest Way corridor. This facility includes low traffic volumes today and provides a high-speed connection from the neighborhood to the Maple Avenue Dry Canyon crossing. With the City's planned completion of the NW 27th Street extension to NW Northwest Way area travel patterns will shift, and the existing neighborhoods will increasingly travel west to access the NW Northwest Way corridor.

Travel through the Echo Rim and Sterling Pointe neighborhoods will occur with development of the Dry Canyon PUD, and this travel pattern is supported and intended by the classification of NW 19th Street and NW Spruce Avenue as *Collector* facilities. City connectivity requirements dictate that the stubbed local street connections of Quince Avenue and NW 19th Street also be connected as part of the new neighborhood, and new connections to NW Northwest Way are limited by the City's arterial access policies. The site plan does include a right-in, right-out connection that will serve the future multi-family areas to help contain these trips to the arterial network.

Neighborhood Collector Roadway System

Within the neighborhoods east of the Dry Canyon PUD the posted speed along NW 19th Street is 35 miles per hour from Maple Avenue north to NW Poplar Avenue, where the speed transitions to 25 miles per hour. Within the 35 mph section none of the adjacent residences have direct access to NW 19th Street and on-street parking is precluded by the bicycle lanes. The change in the posted speed appropriately occurs where direct residential driveway access is provided. On-street parking (and a shared roadway) is provided north of Quince Avenue.

Spruce Avenue serves as the continuation of the Collector roadway system into the Dry Canyon PUD. This street segment allows on-street parking but does not have direct residential driveway access. The Spruce Avenue intersection with NW 19th Street is stop controlled in the eastbound direction, which is appropriate given the "T" configuration of this intersection.

Field observation also noted that use of the NW 19th Street corridor is made more convenient by the all-way stop-control at its intersection with NW Maple Avenue, which improves access to the south or east.

Neighborhood Local Street System

Review of NW 22nd Street south of NW Spruce Avenue shows a standard (36-foot) pavement section that allows on-street parking. Some curvature is provided near the NW Poplar Avenue intersection. North-south travel along this roadway is uncontrolled south to Oak Avenue, where stop signs are provided in the north-south directions. The connection with Maple Avenue is only stopped for traffic on NW 22nd Street, and no posted speed signs were observed throughout the length of the roadway (as is typical for a local residential street where the basic rule dictates a 25 mile per hour speed).

Traffic counts were collected in August 2017 on NW 22nd Street near its intersection with NW Maple Avenue. The count data was incorrectly reported within the August 22, 2017 Transportation Impact Analysis and at the public hearing as 229 daily vehicles along this roadway. Further review of the traffic counts showed that there were 229 vehicles between 12:00 a.m. (midnight) and 12:00 p.m. (noon), and an additional 370 vehicles between 12:00 p.m. and midnight, for a total of 601 vehicles. While the carrying capacity of a local street is much higher than 1,200 vehicles, the current volume is half of the traffic volume that the City of Redmond recommends for its local neighborhood streets. Due to the relatively similar streetscape along NW 22nd Avenue and NW 19th Street traffic calming measures are recommended to encourage the use of the higher-order roadway facilities and maintain appropriate speeds within the adjacent neighborhoods.

Traffic Calming Recommendations

Based on review of area roadways, the following treatments are provided to maintain appropriate neighborhood speeds and volumes. These recommendations would occur with initial site development and would make a monitoring program unnecessary.

- Curb bulb-outs on the southern approach of the NW 22nd Street/NW Spruce Avenue intersection is recommended to encourage motorists to remain on the higher-order Spruce Avenue corridor. This will require relocation of the drainage and new accessible ramps.
- Pending City approval, 25 mph speed signs should be installed at the following locations consistent with Speed Zone standards for residential neighborhoods:
 - NW 22nd Street south of Spruce Avenue for southbound traffic and north of Maple Avenue for northbound traffic.
 - NW 19th Street exiting the Dry Canyon PUD for eastbound traffic.
- Due to the lack of driveway access within the 35 mph segment of NW 19th Street no changes to the posted speed or transition point are recommended.
- Curb bulb-outs should also be installed on the northern approach of the NW 22nd Street/Quince Avenue intersection.
- With the extension of Quince Avenue stop-control should be relocated to the north-south approaches of NW 22nd Street, and east-west movements along Quince Avenue should be uncontrolled.

These treatments are intended to encourage vehicles that choose to route through the adjacent neighborhood to route along the higher-order Collector facilities that have been designated and designed for this level of use. These treatments will also help to enforce appropriate speeds along the local and Collector roadways.

Due to the existing traffic control and posted speeds most trips are expected to access the site from NW Northwest Way via Quince Avenue, Spruce Avenue, or the proposed right-in, right-out access (77% of site-generated trips). The traffic study estimates that approximately 23 percent of the site-generated trips are expected to travel east through the adjacent neighborhood to access the Maple Avenue corridor (86 weekday p.m. peak hour trips). With these traffic calming treatments in place the vast majority of these trips are expected to appropriately route along the Spruce Avenue and NW 19th Street corridor, resulting in fewer than 15 trips per hour along NW 22nd Street (one trip every four minutes). While increased reliance on the 19th Street corridor could be obtained with an increased speed of 35 miles per hour, this is not recommended or considered appropriate within the residential neighborhood.

Further, for traffic study purposes these trip estimates conservatively assume the senior housing elements will function similar to a typical subdivision, despite the much lower trip rates observed in age-restricted housing. Accordingly, these estimates are considered an upper limit of what traffic volumes would realistically route through the neighborhoods, and with this conservative estimate traffic volumes remain consistent with City of Redmond standards.

NORTHWEST WAY SPEEDS

The posted speed along NW Northwest Way is 55 miles per hour due to its low-conflict rural setting. As urbanization occurs, speeds should be reduced to better support multimodal trips and the higher future traffic volumes and level of conflicts typical of an *Arterial*.

Establishment of Posted Speeds

Posted speeds are regulated on public roadways within the State of Oregon by Oregon Administrative Rule 734-020-0015 with exception of low volume roads (roads with an average daily traffic volume of less than 400 vehicles). The standard method of establishing a posted speed requires the performance of an engineering study that assesses the following:

- Free-flow speed measurements to assess the 85th percentile and pace limits;
- Crash rates for areas being considered;
- Comparison of the crash rate to similar facilities;
- The computed speed (85th percentile speed with account of crashes)
- Additional factors related to area context (driveways, multimodal considerations, geometric features, adjacent land use, etc.)

The speed zone recommendation from the engineering study can be varied by a maximum of 10 miles per hour above or below the computed roadway speed on all public roadways within City limits, and a speed zone review panel can be requested if an established speed is contested. Further discretion is permitted on the establishment of transition speed zones where speed changes are more than 20 miles per hour, and the State Traffic Engineer may allow extension of an existing speed zone by up to 500 feet.

NW Northwest Way Speed Transition Recommendations

The current 55 miles per hour posted speed along NW Northwest Way is not conducive to the types of multimodal travel and land uses identified within the Northwest Area Plan. However, field observations noted that the posted speed is appropriate along the Dry Canyon PUD frontage today given the lack of conflict, low volumes, and rural facility characteristics.

The proposed multi-use pathway along the NW Northwest Way frontage is intended to provide more separation between walking and bicycling trips than typical sidewalks would provide. While experienced road bike users will likely remain along the shoulder, this provides an opportunity for young or inexperienced cyclists to more comfortably remain outside of the travel way. In addition, the proposed pathway connectivity through the site and to the Dry Canyon trail system provides regional connectivity completely separated from the roadway system.

Phasing plans for the Dry Canyon PUD are expected to start along the eastern property boundary and extend west, with the final (and highest density) development phases occurring along the NW Northwest Way frontage. Area roadways will be improved as part of the initial phase, however, with the complete extension of NW Spruce Avenue and NW Quince Avenue to NW Northwest Way, and full frontage improvements along NW Northwest Way. These treatments will accommodate dedicated southbound left-turn lanes into NW Spruce Avenue and NW Quince Avenue and will include a northbound right-turn deceleration lane onto NW Spruce Avenue.

The widening of the NW Northwest Way streetscape alone is not expected to change area speed characteristics. With the development of lands along the NW Northwest Way frontage the streetscape will be altered. When this occurs, the City should request a Speed Zone Study through ODOT near the Spruce Avenue access. The ability to vary the computed speed by up to 10 miles per hour should provide the flexibility of reducing speeds along NW Northwest Way to 45 miles per hour.

In addition, with the completion of the NW 27th Street extension to connect with NW Northwest Way a new roundabout has been identified. This treatment will enforce approximately 20 mph circulatory speeds, which would further support the reduced speeds along this segment and would even allow transition speed treatments on the approach.

CONSTRUCTION STAGING PLANS

Neighborhood concerns were raised related to construction traffic traveling through the adjacent neighborhoods along NW 19th Street and NW 22nd Street. As discussed at the hearing, the staging area for the project will be located in the southwest corner of the site along Quince Avenue. Within the initial development phase the connections will be barricaded to prohibit any access through the site. This staging area will serve the overall development. If development within the planned staging area occurs before the northern portion of the site is fully developed, the staging area will be relocated to the final (westernmost) phases of the northern property.

Construction traffic will not be permitted to access the site from the adjoining neighborhood streets. Within contractor agreements this direction will be enforced with financial penalties for non-compliance. The developers will establish a phone number for area neighbors to express concerns during the construction process.

RECOMMENDED CONDITIONS OF APPROVAL

The following provides draft conditions of approval for inclusion within the staff report:

- Within the initial development phase, the following traffic calming treatments are required to address potential cut-through traffic concerns through the adjacent neighborhoods:
 - Installation of curb bulb-outs on the southern approach of the NW 22nd Street/NW Spruce Avenue intersection is required to encourage motorists to remain on the higher-order Spruce Avenue corridor. This will require relocation of the drainage inlets and new accessible ramps.
 - Similarly, curb bulb-outs are required on the northern approach of the NW 22nd Street/Quince Avenue intersection.
 - 25 mph speed signs will be installed at the following locations consistent with Speed Zone standards for residential neighborhoods:
 - NW 22nd Street south of Spruce Avenue for southbound traffic and north of Maple Avenue for northbound traffic.
 - NW 19th Street exiting the Dry Canyon PUD serving eastbound traffic.
- With the extension of NW Quince Avenue west to NW Northwest Way the existing stop-control at the NW 22nd Street/NW Quince Avenue intersection should be relocated to the north-south approaches of NW 22nd Street, and east-west movements along Quince Avenue should be uncontrolled. This treatment will supplement the recommended curb bulb-outs to direct motorists toward the *Collector* roadway system.
- Construction traffic will not be permitted to access the site from the adjoining neighborhood streets; all construction access will be required from NW Northwest Way. Within contractor agreements this direction will be enforced with financial penalties for non-compliance. The developers will establish a phone number for area neighbors to express concerns throughout the construction process.

- Construction staging operations will be situated on the southwest corner of the site. Relocation of this staging area may occur to the northern portion of the PUD along NW Northwest Way if development of the underlying lands is required.

In addition to these approval conditions, the following was recommended or proposed by the applicant as part of the original traffic study:

- North-south pedestrian connections will be required throughout the southern portion of the development within the pedestrian access easements shown. These connections will remain open to the public and connected to area sidewalks through public access easements.
- Design of the gated entrances will require approval by City engineering staff and emergency services. The design will need to comply with emergency access requirements and ensure that queuing is accommodated within the available storage.
- New southbound left-turn lanes serving NW Spruce Avenue and NW Quince Avenue will be required as part of NW Northwest Way frontage improvements.
- A right-turn deceleration lane will be installed at the NW Northwest Way intersection with NW Spruce Avenue as part of the initial site frontage improvements. The specific design treatments will incorporate pedestrian crossing elements that improve visibility and reduce conflicting speeds at the multiuse pathway such as those shown within the FHWA manual on *Small Town and Rural Multimodal Networks*.
- Pedestrian crossing treatments (striped crossing and illumination) should be included at intersections along Spruce Avenue to link the northern and southern portions of the site with the proposed parks.
- The existing connection into the Dry Canyon Trail system will be paved with initial site development to improve access to the regional trail system.
- The development will provide Transportation SDCs to the City of Redmond to fund area transportation system improvements consistent with recommendations within the NAP and City policy.

The following recommendations are provided for consideration by the City of Redmond:

- Trees and shrubbery surrounding the NW Northwest Way/NW Upas Way intersection should be reviewed and removed as appropriate between a height of two and eight feet to improve intersection sight lines.
- The City should review the signage in place at the NW 35th Street/W Antler Avenue intersection. Additional visibility treatments could be provided such as:
 - “Intersection Ahead” signs for through traffic on W Antler Avenue.
 - “Stop Ahead” signs for north-south traffic on NW 35th Street.
 - “Cross Traffic Does Not Stop” supplemental placards on NW 35th Street.If crash patterns persist following installation of signing and striping treatments, additional signing, striping, or control treatments (such as all-way stop-control) could be reviewed.
- With completion of development phases along NW Northwest Way the City of Redmond should request ODOT conduct a speed study near the Spruce Avenue intersection. The City should consider incorporating additional streetscape elements with future projects along the corridor that support a reduced speed of 35 to 45 miles per hour.

Please let me know if you have any questions on these supplemental materials. I trust these further clarify issues that were raised at the hearing and help to address area transportation concerns.