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January 11, 2019

Kate McQuillan
Multnomah County
Transportation Planning and Development
1620 SE 190th Avenue
Portland, OR 97233

RE: Road Rules/Design Variance for EP-2017-6780
Burlington Creek Property

Dear Ms. McQuillan:

To aid in County Transportation and Development review, enclosed you will find a supplemental transportation analysis memorandum prepared by KPFF. The report analyzes intersection and stopping sight distances based on the 85th percentile speeds *plus* 5 mph.

The report documents that current conditions provide sight distances meeting the requirements documented in the County's design standards. However, existing conditions do not meet AASHTO sight distance requirements for the 85th percentile *plus* 5 mph design speed. Sight distance is currently restricted to the south due to a horizontal curve in the road and a hillside on the west side of the roadway. Sight distance is currently restricted to the north due to roadside trees and vegetation on the east side of the roadway.

As proposed in the Road Rules/Design Variance application narrative, measures can be taken to either reduce speeds or improve sight lines to meet AASHTO sight distance guidelines and promote safety.

Justification for the design exception:

In addition to the justifications provided in the design exception application narrative, Metro provides the following additional information.

Metro is of the opinion that customary transportation planning practice for non-posted roadways is to rely on design standards associated with the 85th percentile speeds. In Metro's application submission, applicant proposed mitigation alternatives, including utilizing the 85th percentile travel speeds along the roadway to estimate the required sight distance at the proposed egress driveway onto NW McNamee. Metro's design exception application narrative evaluated and justified the design exception associated with 85th percentile speeds by evaluating the context of the proposed facility, needs of various

project and roadway users, safety, mobility, performance, environmental impacts, project costs, and other factors.

To further address the design variance criteria, Metro proposes another mitigation alternative. That is to use the 85th percentile travel speeds *plus 5 mph* to estimate the required sight distance at the proposed egress driveway onto NW McNamee.

Adding 5 mph to the design speed would achieve an additional level of road user safety. As demonstrated by the attached report, sight line improvements can be made to achieve a design speed of 43 mph for north bound traffic and 40 mph for south bound traffic. This would result in a significant reduction in the amount of land disturbance, construction, and associated costs from what would be required for the 55 mph design speed. Intersection Sight Distance improvements based on the 85th percentile plus 5 mph design speed would exceed the minimum AASHTO Stopping Sight Distance standard based on the same speed in both directions.

An important consideration when reviewing a design exception request is the effect on other standards. See Code § 2.1.3. In this matter, approving the design exception would not only be consistent, but it would also promote the purposes and objectives of applicable zoning and overlay district projections.

The subject property includes CFU, Hillside Development and SEC zoning overlay protections. These standards generally regulate disturbances. The commercial forest regulations seek to conserve and protect designated forest lands for timber production, wildlife habitats, water quality, and recreational uses.

Code section 33.2000 provides:

“The purposes of the Commercial Forest Use District are to conserve and protect designated lands for continued commercial growing and harvesting of timber and the production of wood fiber and other forest uses; to conserve and protect watersheds, wildlife habitats and other forest associated uses; to protect scenic values; to provide for agricultural uses; to provide for recreational opportunities and other uses which are compatible with forest use; implement Comprehensive Framework Plan Policy 11, Commercial Forest Land; the Commercial Forest Use policies of the West Hills Rural Area Plan, and to minimize potential hazards or damage from fire, pollution, erosion or urban development.”

The SEC overlay seeks to protect, conserve, enhance, restore, and maintain significant natural and man-made features of public value.

Code section 33.4500 provides:

“The purposes of the Significant Environmental Concern subdistrict are to protect, conserve, enhance, restore, and maintain significant natural and man-made features which are of public value, including among other things, river corridors, streams,

lakes and islands, domestic water supply watersheds, flood water storage areas, natural shorelines and unique vegetation, wetlands, wildlife and fish habitats, significant geological features, tourist attractions, archaeological features and sites, and scenic views and vistas, and to establish criteria, standards, and procedures for the development, change of use, or alteration of such features or of the lands adjacent thereto."

The Hillside Development and Erosion Control overlay seeks to minimize losses due to earth movement hazards and to minimize erosion.

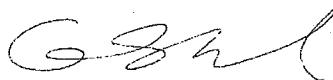
Code section 33.5500 provides:

"The purposes of the Hillside Development and Erosion Control subdistrict are to promote the public health, safety and general welfare, and minimize public and private losses due to earth movement hazards in specified areas and minimize erosion and related environmental damage in unincorporated Multnomah County...."

Determining the level of improvement and disturbance required to ensure road user safety involves a balancing act among competing objectives. Making sight distance improvements to achieve standards associated with a 55 mph design speed would require a substantial disturbance to natural landscapes, habitat, and slopes. Those improvements, while not only being cost prohibitive and denying the public a reasonable use of the property, are not necessary to achieve safe operating conditions given actual operational speeds and conditions at and near the subject access driveway intersection. Of note, there is no crash history of record at the existing intersection.

Alternatively, making sight distance improvements to achieve standards associated with the 85th percentile plus 5 mph design speed is sensitive to the local context, would significantly reduce disturbances to natural landscapes, habitat, and slopes adjacent to the right of way, avoid unnecessary environmental impacts, preserve public and taxpayer resources, all while achieving safe operating conditions given actual operational speeds and conditions. Approving the design exception will provide a public benefit that is better than that which would result without a road variance – which is no public park improvements or safety enhancements constructed.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read 'G Shepherd', written in a cursive style.

Gary Shepherd

CC: Kevin Cook, Multnomah County

Memorandum

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DATE: January 10, 2019

PROJECT: 312064.5-Metro North Tualatin
Mountain Access

SUBJECT: Burlington Creek Forest Sight Distance
Evaluation

TO: Karen Vitkay
Metro

FROM: Curt Vanderzanden
KPFF Consulting Engineers

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As requested by Metro and Multnomah County and as a follow up to the June, 1, 2018 Memo KPFF previously provided, we have completed an analysis of intersection and stopping sight distances based on the 85th percentile speeds from the study completed in 2014 plus 5 mph.

The following table summarizes the measured and required intersection sight distance per Multnomah County Design and Construction Manual (MCDCM) *Table 2.3.2 Minimum Corner Intersection Sight Distance*.

Table 1: MCDCM Intersection Sight Distances

Case	85 th Percentile Design Speed Plus 5 mph	Measured	Standard Requirement	Meets Standard?	Sight Obstruction
B1, Left turn from Stop	43 mph (NB) 40 mph (SB)	293 ft (NB) 300 ft (SB)	195 ft 180 ft	Yes	N/A
B2, Right Turn from Stop	43 mph (NB)	293 ft (NB)	195 ft	Yes	N/A
F, Left Turn from the Major Road	43 mph (NB)	270 ft (NB)	195 ft	Yes	N/A

While the above table shows that the current condition provides sight distances meeting the requirements documented in the County's design standards, we also conducted an evaluation utilizing the current AASHTO standards.

The following Table summarizes the measured and required intersection sight distance per the AASHTO Green Book, *Table 9-6 Design Intersection Sight Distance – Case B1, Left Turn from Stop*, *Table 9-8 Design Intersection Sight Distance – Case B2, Right Turn from Stop and Case B3, Crossing Maneuver*, and *Case F, Left Turn from the Major Road*. And the attached Exhibit "A" reflects the information shown on Table 2.

Memorandum

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Table 2: AASHTO Intersection Sight Distances

Intersection Sight Distance (ISD)						
Case	85th Percentile Design Speed Plus 5 mph	Measured	Standard Requirement	Meets Standard?	Design Speed Achieved Under Current Conditions	Sight Obstruction
B1, Left Turn from Stop	43 mph (NB) 40 mph (SB)	293 ft (NB) 300 ft (SB)	478 ft 445 ft	No	26.5 MPH	Hillside, Horizontal Curve
B2, Right Turn from Stop	43 mph (NB)	293 ft (NB)	412 ft	No	27.2 MPH	Trees and Vegetation
F, Left Turn from the Major Road	43 mph (NB)	270 ft (NB)	349 ft	No	33.4 MPH	Hillside, Horizontal Curve

The Multnomah County Design Standards and AASHTO Standards state that when minimum intersection sight distance cannot be met, the minimum sight distance should be no less than the stopping sight distance on the major street. The required stopping sight distances were calculated and are summarized below in Table 3.

Table 3: AASHTO Stopping Sight Distances

Location	Direction	85 th Percentile Speed Plus 5 mph	Measured Sight Distance	Stopping Sight Distance (SSD)		
				Measured Average Slope	AASHTO Recommendation	Adequate? (Yes/No)
Burlington Creek Forest (NW McNamee Rd)	NB	43 mph	293 ft	-12.5%	435 ft	No
	SB	40 mph	300 ft	12.8%	260 ft	Yes

Summary

- The existing conditions do not meet AASHTO ISD requirements for the 85th percentile plus 5 mph design speed in the applicable direction of travel. Based on AASHTO guidelines, design speeds achieved given the existing conditions are in the range of 26.5 to 33.4 mph.
- Sight distance (measured at 15 feet from the eastern pavement edge of NW McNamee Road) is currently restricted to the south at approximately 300 feet, due to a horizontal curve in the road and a hillside on the west side of the roadway.
- Sight distance is currently restricted to the north at approximately 293 feet, due to roadside trees and vegetation on the east side of the roadway.

Attachments: Exhibit "A"

10100312064.5-JS

478' ISD (43 mph NB)

Approximate limits of excavation to achieve ISD for 43 mph.

349' ISD (43 mph NB)

270' ISD (33.4 mph NB)
(Measured)

293' ISD (26.5 m)
(Measured)