PBOT
PORTLAND BUREAU OF TRANSPORTATION
1120 SW Fifth Ave., Suite 800 Portland, OR 97204 503-823-5185
Fax 503-823-7576 TTY 503-823-6868 www.portlandoregon.gov/transportation
Chloe Eudaly Commissioner **Chris Warner** Director

Memorandum

To: Bill Cunningham
From: Bob Kellett, Ningsheng Zhou
RE: Better Housing by Design Recommended Draft, 2019 Transportation Analysis
Date: September 6, 2019

This memorandum provides a high-level summary of the traffic impact assessment performed on the Better Housing by Design (BHD) Recommended Draft, August 2019. It includes recommended actions to address potential transportation impacts generated by BHD.

Summary of Key Findings

The overall added traffic from BHD on the citywide transportation network during the peak PM hour is not significant. The analysis finds that BHD will not add significant future PM peak hour automobile traffic on PBOT and ODOT "hot spot" roadway segments that were identified in the 2035 Comprehensive Plan and 2035 Transportation System Plan as areas of concern for future capacity and safety. On average, BHD will add 18 peak PM hour vehicles to hot spot road segments. Impacts are localized and can be adequately mitigated through strategies identified in BHD and planned capital projects in the 2035 Transportation System Plan.

Summary of Recommendations

Given the small scale and localized nature of the added traffic, the impacts can be reasonably mitigated through the following Transportation Demand Management strategies that are proposed in the Better Housing by Design Recommended Draft, August 2019:

1. *Financial TDM incentives for larger apartments:* In all the multi-dwelling zones in locations close to frequent transit, projects with buildings with 10 or more units will be required to provide a financial incentive and to use strategies that reduce transportation impacts, such as providing residents with transit passes, bike share or car share memberships, and information on transportation options.
2. *Off-street Parking Management:* BHD proposes to eliminate minimum off-street parking requirements for most development on small sites (up to 10,000 square feet in size). On larger sites, the minimum required parking ratio is proposed to be reduced by half -- from one space for each unit to one space for every two units.
3. *Pedestrian-supportive Development:* Better Housing by Design proposes new requirements that will improve the pedestrian environment and encourage more pedestrian trips in multi-dwelling zones.
4. *Improved Connectivity in East Portland centers:* BHD proposes to facilitate improved connectivity in centers in East Portland by requiring street frontages wide enough to provide space for new street connections and by calculating development allowances prior to street dedication.

Transportation Impact Analysis

Purpose

Statewide Planning Goal 12 requires Portland's plans to be based, in part, on an assessment of transportation needs. This memorandum provides a high-level summary of the traffic assessment performed on the proposed Better Housing by Design (Recommended Draft, August 2019). The proposal includes revising development and design standards in Portland's multi-dwelling residential zones (R3, R2, R1 and RH) outside the Central City.

Background

Goal 12 and The Transportation Planning Rule

Statewide Planning Goal 12 requires the City to maintain a balanced, multi-modal transportation system that meets identified local, regional and state needs. It requires cities to plan for and develop transportation facilities in close coordination with urban development. A key objective of Goal 12 is to reduce reliance on single occupancy automobile use, particularly during the morning and afternoon commutes. To accomplish this, the Goal requires street connectivity and land use patterns, "that make it more convenient for people to walk, bicycle, use transit, use automobile travel more efficiently, and drive less to meet their daily needs." Goal 12 is implemented by administrative rules, including the Transportation Planning Rule, OAR 660-012.

Statewide Planning Goal 2 requires Portland's Comprehensive Plan and implementing regulations to be coordinated with other levels of government, including Metro and the Oregon Department of Transportation.

- The Oregon Highway Plan and the Regional Transportation Plan. Policy 1F of the *Oregon Highway Plan*, as amended on December 21, 2011, establishes mobility targets based on volume to capacity, "v/c," ratios. These targets are "performance standards" within the meaning of Statewide Planning Goal 12 and the Transportation Planning Rule. The Policy 1F mobility targets only apply to highways that are part of the state system.

- The Metro Regional Transportation Functional Plan (Chapter 3.08) includes "interim mobility targets" (Table 2.4), non-sov modal targets (Table 2.5), and other performance targets (Table2.3), which apply to regional facilities in Portland.

- Portland's Transportation System Plan also requires the City to maintain acceptable levels of performance on state facilities and the regional arterial and throughway network, consistent with the interim standard in Table 9.2.

When a comprehensive plan and its associated transportation system plan are acknowledged to comply with Goal 12, the land uses allowed by the plan and the planned supporting transportation facilities are deemed to be in sufficient balance. When the land use side of that equation, i.e. the comprehensive plan or zoning designations, are changed, the city must demonstrate that this balance can be maintained, as required by OAR 660-012-0060.

2035 Comprehensive Plan Analysis and Results

In 2016, the City of Portland adopted a new Comprehensive Plan. At that time, the City completed an analysis of the transportation system, including assessing the traffic impacts of the new land use map being adopted with the new plan. To accomplish this analysis, the City worked with Metro to run the regional travel demand model. That assessment was acknowledged by DLCD with Task 3 of Portland's Periodic Review process (DLCD Order 001882).[1] Transportation modeling done with the 2035 Comprehensive Plan assumed the citywide 20-year growth allocation taken from the 2012 Metro Urban Growth Report.[2] At that time Metro planning assumptions allocated approximately 123,000 additional households and 142,000 additional jobs to Portland through 2035. The City relied on its Buildable Lands Inventory and a GIS-based Allocation Model to estimate the distribution of the expected growth across the City. This inventory and model were also acknowledged by the state with Task 3 of Portland's Periodic Review process and revised with Task 4 (DLCD Order 001892).[3]

Because of the 2035 Comprehensive Plan traffic analysis, the City and ODOT worked together to identify several areas of ongoing concern that required further monitoring and study (Attachment A). This information was also memorialized in the City's Transportation System Plan (Chapter 6, Projected ODOT "Hot Spot" Locations Refinement Plan).

As a supplement to this analysis, the City also commissioned a study to assess the impact of adopting additional Transportation Demand Management (TDM) incentives with the 2035 Comprehensive Plan[4]. TDM is defined as:

> "Actions taken to change travel behavior in order to improve the performance of transportation facilities, reduce the need for additional road capacity, and reduce impacts on residential neighborhoods. Examples include encouraging the use of alternatives to single-occupant vehicles (SOVs), ridesharing and vanpools, parking management, and trip-reduction ordinances." (Portland TSP Glossary)

[1] Analysis memo and data in Portland Periodic Review Task 3 record, Vol. 1.4.B, page 3511.
[2] Metro Council Ordinance No. 12-1292A
[3] Growth Scenarios Report July 2015, Portland Periodic Review Task 3 record, Vol. 1.1.K, page 166;
[4] Fehr and Peers Memo, Portland Periodic Review Task 3 record, Vol. 1.4.B, page 3558.

The City adopted an initial package of TDM measures with the 2035 Comprehensive Plan. These measures mandate certain multimodal financial incentives with new mixed-use buildings with more than 10 dwelling units (Portland City Code Chapter 17.107). This incentive aims to reduce automobile trips associated with new development.

Methodology

To perform this analysis, the acknowledged 2035 Comprehensive Plan transportation analysis was used as the baseline for comparison. BPS first estimated the impact of BHD on the distribution of households, and PBOT then performed transportation analysis of those impacts.

Household Allocation

The Buildable Lands Inventory and Allocation GIS Model was used by BPS to estimate how the BHD proposal would change household distributions[5].

The model consists of four basic steps:

1. Calculate existing development density and allowed development entitlements in terms of building square footage, number of multi-family residential units, number of single-family residential lots, and estimated number of jobs;
2. Identify parcels that significantly underutilize their allowed development entitlement. In the single dwelling zones (RF-R2.5), parcels that can be subdivided into 3 or more parcels are mapped as "underutilized". The model uses floor area ratios in some multi-dwelling and mixed-use zones.
3. Estimated development capacity is discounted by constraint factors to reflect barriers to development (steep slopes, floodplains, brownfields, etc.). The result is an estimated development capacity in terms of building square footage, number of multi-family residential units, number of single-family residential lots, and estimated number of jobs;
4. Estimate the distribution of the expected 20-year housing and employment growth to the available development capacity. This is necessary because Portland has more capacity than will be used in the 20-year planning horizon. The allocation portion of the model uses development trends and several other factors to make this estimate.

BHD changes both the total development capacity of the City and how growth will be distributed. To evaluate the zoning entitlement changes proposed by the Better Housing by Design and changes introduced by the Planning and Sustainability Commission, several changes were required in the BLI model.

1. Zoning maps used in the model reflect the multi-dwelling zone changes in the Alphabet and King's Hill Historic Districts.

[5] Additional detailed information about the original model is found here: https://www.portlandoregon.gov/bps/article/627460

2. New multi-dwelling zones (RM1, RM2, RM3, RM4) replace previous Comprehensive Plan zones (R3, R2, R1, RH). Previously, R3, R2, and R1 used density for calculating residential capacity, whereas the new multi-dwelling zones all use FAR allowances to calculate capacity.
3. Floor Area Ratio (FAR) allowances for RM4 (previously RH with 4:1 FAR) were lowered to 3:1 in Historic Districts.
4. Certain constrained parcels were excluded or further constrained:
    - Parcels considered "narrow, deep lots" (less than 90' wide and deeper than 160') in the Minimum Site Frontage Areas of the East Portland Pattern Area had their residential capacity reduced by 50%.
5. Other zoned capacity assumptions were changed from the standard 2035 Comp Plan model
    - Changes from the 2035 Central City Plan and Manufactured Dwelling Park (MDP) projects are factored in.
    - Actual development that has occurred since 2015 is reflected in the model, which complicates a direct comparison between previous model outputs based on unit allocation, but overall units forecast to be developed by 2035 remain consistent.

<u>Traffic Impact Analysis Methodology</u>

Using the Household Allocation analysis performed by BPS, households were grouped into 11 groups of transportation analysis zones (TAZ) (Attachment B). Future PM Peak auto demands, land use data, and flow bundle traffic from the 11 areas were used as model inputs and assessed to determine future added traffic on roadways (Attachment C).

Based on the trip generation rates from each BHD area in the 2035 Comprehensive Plan model, the analysis estimated the added PM peak hour auto vehicle trips resulting from the additional BHD residential growth, only in the seven areas with increased changes in expected households. The added demand rates in Table 2 for each BHD area is applied to the projected future area traffic on the roadways to generate the added BHD traffic on ODOT/PBOT streets of concern. The added traffic from each individual BHD area is summed up to evaluate the total traffic impacts. The area traffic is not the total traffic on the street, but the part of the traffic that either comes from or goes to a BHD area -- a flow-bundle-volumes (FB).

$$\text{Total added traffic}_j = \Sigma^{6}_{k=1} \text{ FB Volumes}_k * \text{Added Demand Rate}_k$$

J = each street segments on every ODOT/PBOT concern list

k = 1 to 6 for each BHD2019 area

Key Findings

A. BHD changes the geographic distribution of new household growth over the next 20 years (Table 1). Household growth is greatest in centers and neighborhoods close to Central City. The change in geographic distribution of new household growth results in a shift of where some transportation trips occur.

Table 1: Better Housing by Design Household Re-Allocation Summary

BHD Areas	Comp Plan 2035 Households	BHD Households	Change in number of Households
1. Central City South	14,760	15,677	917
2. St. Johns	9,289	9,193	-96
3. Interstate	14,843	15,467	624
4. Central City NW	19,776	21,966	2190
5. Argay	3,067	3,039	-28
6. Outer Powell	13,402	13,395	-7
7. Lents	8,336	8,282	-54
8. Inner Powell	12,457	13,022	565
9. McLoughlin	4,317	4,464	147
10. Hollywood	17,615	18,801	1186
11. Sellwood	4,138	4,735	597
Rest of Portland	247,702	241,342	-6,360
City Total	369,700	369,380	-320

B. The overall added traffic from BHD on the transportation network during the peak PM hour is not significant. In the seven BHD areas where there is expected to be household growth, peak PM hour vehicle demand is forecasted to grow between 2%-11% (Table 2) with added trips dispersed across the transportation network in the areas (Attachment D).

Table 2: BHD PM Peak Hour Auto Vehicle Demands Summary

BHD Areas	Comp Plan 2035 Auto Trips	BHD added trips	BHD added %
1. Central City South	11,800	365	3.1%
3. Interstate	10,920	345	3.2%
4. Central City NW	10,940	645	5.9%
8. Inner Powell	8,450	270	3.2%
9. McLoughlin	4,720	100	2.2%
10. Hollywood	13,750	475	3.4%
11. Sellwood	2,590	280	10.9%

C. As part of the Comprehensive Plan, ODOT and PBOT identified a list of streets of concern where future congestion may make it difficult for jurisdictional standards to be met. On average, BHD will add 18 peak PM hour vehicles to these street segments and will not significantly impact average V/C (Table 3). The maximum added vehicles to any of these segments during peak PM hours is 89 vehicles at the southbound 99E/Ross Island Bridge Interchange (Attachment E). For two street segments, both on PBOT's concern list, the small number of added vehicles from BHD increases V/C above the .99 threshold in the Transportation System Plan (table 4). Impacts to state highway facilities do not meet the threshold for "further degradation" as identified in the Oregon Highway Plan Action 1F.5.

Table 3. Traffic summary for all links on ODOT/PBOT streets of concern

	# of links	Length (miles)	Comp Plan			BHD		
			Average Volumes	Average V/C	Max V/C	Average Volumes	Average V/C	Max V/C
All streets	407	60.0	1230	0.76	1.61	1248	0.77	1.65
with >=1% added traffic	288	36.2	1419	0.76	1.61	1446	0.78	1.65
New Congested Streets	2	0.15	584	0.76	0.99	617	0.76	1.03
Congested St. in Comp.	70	12.5	1554	1.15	1.61	1562	1.17	1.65
Cong. In Comp. & w/ >=1% added	48	7.5	1747	1.16	1.61	1780	1.19	1.65

Table 4. Streets Exceeding .99 V/C Threshold

Location	Facility	TSP Class	Comp Plan		BHD	
			Vol	VC	Vol	VC
SE 17th Ave, N/ Tacoma St, SB	PBOT	Nbhd Collector	576	0.96	618	1.03
SW 6th Ave, N/ Sheridan St, NB	PBOT	Local Service St	597	0.99	619	1.03

D. As part of a safety analysis, potential impacts from shifting BHD traffic to interstate on- and off-ramps was examined. Impacts were found to be minimal with most ramps not experiencing additional vehicles and queueing. One ramp, the I-405 EB exit at SW Broadway, is projected to add 39 vehicles during peak PM hour. A planning level queue length analysis concluded that the added BHD traffic will not result in a safety concern at the ramp. AM ramp queue also estimated for this analysis. AM volume is estimated from PM volumes by using ODOT's AM/PM ramp counts. With the added BHD traffic, the maximum queue length would be 30 vehicles, while the ramp length can safely occupy 33 cars.

Recommendations

The modelling shows that the overall impact of BHD on the citywide transportation system is not significant. It does, however, result in some impacts on road segments that have previously been identified as areas of concern. These impacts are not large in terms of absolute numbers

of added vehicles during peak PM hour and can be mitigated through the transportation demand management strategies proposed in BHD and planned capital projects identified in the 2035 Transportation System Plan.

Transportation Demand Management Strategies

The Transportation Planning Rule defines Transportation Demand Management as: "actions which are designed to change travel behavior to improve performance of transportation facilities and to reduce need for additional road capacity. Methods may include, but are not limited to, the use of alternative modes, ride-sharing and vanpool programs, trip-reduction ordinances, shifting to off-peak periods, and reduced or paid parking." Reducing demand for automobile trips is a key strategy for offsetting potential transportation impacts from BHD.

The following Transportation Demand Management strategies are included in BHD's Recommended Draft. It is recommended that they be adopted by City Council as part of the plan:

- *Financial TDM incentives for larger apartments*

  Portland City Council adopted an initial package of TDM measures with the 2035 Comprehensive Plan in 2016. These measures mandate certain multimodal financial incentives with new mixed-use buildings with more than 10 dwelling units (Portland City Code Chapter 17.107). This regulation is proposed to be expanded as part of BHD. In all the multi-dwelling zones in locations close to frequent transit, projects with buildings with 10 or more units will be required to use strategies that reduce transportation impacts, such as by providing residents with transit passes, bike share or car share memberships, and information on transportation options. This strategy will reduce transportation demand in multi-dwelling zone areas where transportation trips are expected to shift and on the overall transportation network.

- *Off-street Parking Management*

  A key tool in transportation demand management, as identified in the Transportation Planning Rule, is parking management. To reduce reliance on automobiles, the Transportation Planning Rule requires local governments within an MPO to achieve a 10 percent reduction in the number of parking spaces per capita over a planning period (660-012-0045). Additionally, Portland's Comprehensive Plan Policy 9.58 directs the city to: "Regulate off-street parking to achieve mode share objectives, promote compact and walkable urban firm, encourage lower rates of car ownership, and promote the vitality of commercial and employment areas".

  Consistent with this approach to reducing reliance on automobiles and promoting a walkable urban form, BHD proposes to eliminate minimum off-street parking requirements for most development on small sites (up to 10,000 square feet in size) in the multi-dwelling

zones. On larger sites, the minimum required parking ratio is proposed to be reduced by half -- from one space for each unit to one space for every two units.

- *Pedestrian-Supportive Development*

  The Transportation Planning Rule encourages pedestrian-friendly development that makes it safe and convenient for trips to be made by walking, and that facilities less driving to meet daily needs. Better Housing by Design proposes new requirements that will improve the pedestrian environment and encourage more pedestrian trips in multi-dwelling zones. It limits front garages and parking structures to 50 percent of buildings and streets. It also disallows parking from being located between buildings and streets and it requires building entrances to be oriented to streets or to courtyard.

- *Improved Street Connectivity in East Portland centers*

  The Transportation Planning Rule recognizes the importance of street connectivity in making it "more convenient for people to walk, bicycle, use transit, use automobile travel more efficiently, and drive less to meet their daily needs," especially in centers. BHD proposes to facilitate street connections and to improve connectivity in centers in East Portland by requiring street frontages wide enough to provide space for new street connections and by calculating development allowances prior to street dedication.

Additional Transportation Demand Management Recommendations

The following citywide transportation demand management strategies are not included as part of the BHD Recommended Draft. They should be considered by PBOT as further traffic impact mitigation tools.

- *Bicycle parking improvements*

  The provision of bicycle parking is a transportation demand strategy. (Transportation Planning Rule 660-012-0045 3(a)). Research has shown that the lack of a safe and secure place to park a bicycle is a key barrier for bicycling as transportation. Portland's existing bicycle parking code (Portland City Code Chapter 33.266.200) was primarily written in 1996. A Recommended Draft of the Bicycle Parking Code update has advanced to City Council for deliberation this fall. The Bicycle Parking Code Recommended Draft proposes to update the minimum required amount of short- and long-term parking, enhance security standards to help prevent bike theft, and accommodate a greater variety of bicycles in buildings with five residential units or more in all zones, including BHD's multi-dwelling residential zones. It is recommended that City Council adopt the updated bicycle parking code to expand on-site and secure bicycle parking to facilitate transportation by bicycles.

- *On-street parking management*

  The Transportation Planning Rule points to the designation of residential on-street parking districts as a tool that local governments within an MPO can use to reduce reliance on

automobile trips (660-012-0045). Portland has had an Area Parking Permit Program in effect since 1981. In recent years, this program has expanded to include 17 zones with neighborhoods and businesses collaborating with PBOT to create the rules for their zone. Per City Council ordinance, the Area Parking Permit Program can impose a surcharge on parking permits. The money raised from the surcharge can then be used to fund Transportation Demand Management strategies that reduce automobile trips. This includes a Transportation Wallet program where participants can receive significantly reduced transit, bike share, and other mobility passes in exchange for forgoing an on-street parking permit. An 2018 evaluation of the program in NW Portland showed a 13% reduction in on-street parking during peak periods. It is recommended that PBOT continue to seek opportunities to work with neighborhoods to expand the Area Parking Permit Program and related TDM programming.

- *"Smart Trips" education and outreach*

  Another proven transportation demand management strategy is the provision of transportation options information and encouragement. Portland has been a national leader in this field through its Smart Trips program. Smart Trips incorporates an innovative and highly effective individualized marketing methodology, which hand-delivers packets and personalized emails to residents who wish to learn more about all their transportation options. Key components feature biking and walking maps, robust and sophisticated online, digital and paper resources, and organized activities which get people out in their neighborhoods or places of employment to shop, work, and discover how many trips they can easily, conveniently and safely make without using a car. Evaluations over the past 15 years show that Smart Trips reduces drive alone trips by about 9%. In recent years, Smart Trips has targeted people that are new to Portland and those who are moving within the city to new homes. Research shows that this is often the most effective time to encourage people to try new ways of getting around. It is recommended that PBOT continue to provide targeted TDM to people moving into new housing with a focus on new residents in BHD's multi-dwelling zones.

- *Safe Routes to Schools program*

  Like Smart Trips, Portland's Safe Routes to Schools program reduces automobile trips through information, encouragement, and investments in infrastructure that make it safe for students to walk and bike to school. In 2018, the program reported that citywide 42% of K-5th grade trips and 40% of 6th-8th grade trips utilized active transportation. This program, which is an important tool for reducing auto trips during peak hours, will continue citywide under BHD. It is recommended that PBOT evaluate targeted Safe Routes to Schools programming in TAZs expected to see increased growth through BHD.

Planned Capital Projects

The impact of added auto trips from BHD are expected to be on identified hot spots on both PBOT and ODOT managed facilities. Through the process of adopting the 2035 Comprehensive Plan and the 2035 Transportation System Plan, PBOT and ODOT agreed to perform refinement planning in areas identified with potential safety and/or projected capacity issues. The agencies have agreed that before the next major update of the TSP, PBOT will identify feasible actions for addressing these issues, as well as analyze potential alternative performance measures. In performing this work, it is recommended that PBOT, ODOT, and other relevant agencies, take into consideration the additional auto trips from BHD when designing project- and system-level solutions.

It is also recommended that additional projected auto trips from BHD be analyzed, and to the extent possible, mitigated during the planning, design, and implementation of future planned capital projects in roadway segments identified as areas of concern. This should include projects in areas of concern identified on the project list of the 2035 Transportation System Plan (Attachment F).

Conclusion

The Better Housing by Design will change the geographic distribution of new household growth during the Comprehensive Plan planning period, and this reallocation will result in some changes in transportation trips. The overall impact on the transportation network is minimal and localized, and can be adequately and feasibly mitigated through the transportation demand management strategies that are proposed in the BHD Recommended Draft. Citywide transportation demand management programs should take into consideration BHD's impacts when designing and implementing programs that aim to reduce automobile trips.

Attachments

A – ODOT/PBOT Streets of Concern

B – Household Allocation Groups

C – Traffic Impact Analysis Methodology

D – 2035 PM Peak Traffic Added by BHD

E – 2035 PM Peak Traffic Added by BHD on Streets of Concern

F - Planned Capital Projects in Areas of Concern