# APPENDIX F: TRANSPORTATION ANALYSIS, DOCKET SITE

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# MEMORANDUM

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Project #: 17862

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From: Chris Brehmer and Julia Kuhn

Project: Clark County Rural Industrial Land Bank

Subject: Transportation Findings - DRAFT

This memorandum summarizes transportation related information in support of the Clark County Rural Industrial Land Bank project (herein referred to as RILB). Specifically, information is provided related to the range of anticipated site trip generation, supporting roadway infrastructure needs, and future analysis considerations.

## TRIP GENERATION

Preliminary trip generation estimates for the RILB site were developed based on land use assumptions identified by MacKay Sposito in July 2015. The land use analysis identifies a total of 383 acres of developable land.

Per conversations with the project team, the land likely would be developed within a range of 15 to 25 percent building coverage for typical industrial developments, yielding a potential for approximately 2.5 million to 4.2 million square feet of building area. The trip generation associated with industrial facilities could vary widely depending on the actual tenants and the amount of on-site employment. In the past, many industrial users had a large number of employees who worked over multiple shifts; today, some industrial users are more automated and require much fewer employees per square foot. In addition, industrial sites are also being used for "server farms" by large tech firms that also have a very low employee density. Finally, the presence or absence of office or commercial services within the site will also influence trip generation.

We prepared a range of trip generation estimates to offer order-of-magnitude insights into the trip potential associated with the RILB. Trip estimates were prepared using trip rates obtained from the standard reference, *Trip Generation Manual, 9th Edition*, published by the Institute of Transportation Engineers (ITE).

Table 1 below summarizes a range of trip estimates for the RILB area[1].

**Table 1 Trip Generation Estimates**

| Land Use Category | ITE Code | Daily Trips | Weekday AM Peak Hour | | | Weekday PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Total Trips | In | Out | Total Trips | In | Out |
| 15% Building Coverage (2,502,500 square feet of building space) | | | | | | | | |
| All Industrial Park | 130 | 17,100 | 2,050 | 1,680 | 370 | 2,125 | 445 | 1,680 |
| All Business Park | 770 | 31,100 | 3,505 | 2,980 | 525 | 3,155 | 820 | 2,335 |
| 75% Industrial Park & 25% Business Park | 130/ 770 | 20,600 | 2,415 | 2,005 | 410 | 2,385 | 540 | 1,845 |
| 75% Warehousing & 25% Business Park | 150/ 770 | 14,500 | 1,440 | 1,190 | 250 | 1,390 | 355 | 1,035 |
| 25% Building Coverage (4,170,900 square feet of building space) | | | | | | | | |
| All Industrial Park | 130 | 28,500 | 3,420 | 2,805 | 615 | 3,545 | 745 | 2,800 |
| All Business Park | 770 | 51,900 | 5,840 | 4,965 | 875 | 5,255 | 1,365 | 3,890 |
| 75% Industrial Park & 25% Business Park | 130/ 770 | 34,300 | 4,025 | 3,345 | 680 | 3,975 | 900 | 3,075 |
| 75% Warehousing & 25% Business Park | 150/ 770 | 24,100 | 2,400 | 1,985 | 415 | 2,315 | 590 | 1,725 |

As shown in Table 1, depending on the scenario ultimately developed, the trip generation potential of the RILB site assuming all business park uses is more than double that of a scenario that could include a mix of uses and/or a large component of warehousing. Development of the RILB as a business park would reflect a mixture of industrial, office, and commercial retail uses. It is also possible that the overall site trip generation could be lower than the estimates in Table 1, particularly if a large, highly mechanized tenant or server farm occupies the site and/or if a large tenant that relies heavily on rail transport occupies a large portion of the site.

[1] Note: *Trip Generation* describes industrial parks as follows: "Industrial parks contain a number of industrial or related uses. They are characterized by a mix of manufacturing, service, and warehouse facilities with a wide variation in the proportion of each type of use from one location to another. May industrial parks contain highly diversified facilities – some with a large number of small businesses and others with one or two dominant industries."

*Trip Generation* describes business parks as follows: "Business parks consist of a group of flex-type or incubator one- or two-story buildings served by a common roadway system. The tenant space is flexible and lends itself to a variety of uses, the rear side of a building is usually served by a garage door. Tenants may be start-up companies, or small mature companies that require a variety of space. The space may include offices, retail and wholesale stores, restaurants, recreation areas and warehousing, manufacturing, light industrial, or scientific research functions. The average mix is 20/30 percent office/commercial and 70 to 80 percent industrial/warehousing."

*Trip Generation* describes warehousing as follows: "Warehouses are primarily devoted to the storage of materials, but they may also include office and maintenance areas."

At this point, the estimates provided in Table 1 are merely to offer an order of magnitude estimate for general transportation facility system needs associated with development of the RILB. Prior to any site development, the actual site trip estimates will need to be refined for State Environmental Policy Act (SEPA) and transportation concurrency review purposes. Trip estimate refinement will vary depending on the actual tenants proposed for the site.

### Transportation Demand Management

The vehicular trip generation associated with development of the RILB area will have direct implications on roadway capacity and delay. As future details related to specific land users become available, Transportation Demand Management (TDM) strategies to provide multimodal travel options for employees and visitors will be pursued and will vary depending on the tenants as well as the future availability of transit service. Potential TDM transportation demand management strategies could include, but are not limited to:

- Scheduling of shift work to avoid simultaneous peaking of employee travel demand from the various tenants within the RILB area (e.g., spreading site arrivals and departure patterns vs. arrival/dismissal periods that correspond and match peak travel demand along SR 503);
- Provision of transit service to the area through C-Tran (C-Tran does not currently provide fixed route transit service along roadways fronting the site);
- Providing pedestrian and bicycle connectivity to adjacent neighborhoods;
- Actively facilitating rideshare, shuttle service, carpool or vanpool arrangements; and/or
- Encouraging use of rail shipping vs. roadway-based shipping.

## TRANSPORTATION INFRASTRUCTURE CONSIDERATIONS

The project team developed a conceptual plan to integrate land use, transportation, wetland and storm water system needs. Key transportation infrastructure elements and considerations are described below, along with their application to the concept land use plan.

### Roadway Elements

The study area is bisected by SR 503, a five-lane state highway operated and maintained by the Washington State Department of Transportation (WSDOT). SR 503 is designated as a limited access state highway and is intended to convey commuter and freight trips from community to community efficiently. Because of the limited access designation, direct driveway access to SR 503 is discouraged and new developments are directed to other roadways for access where possible. Further, WSDOT seeks a minimum half-mile spacing of traffic signals along the segment of SR 503 in the study area.

For the purposes of the RILB development, it is likely that direct access to SR 503 would occur at one new signalized intersection on SR 503 and that other trips would access the site through Clark County roadways linking to the existing signalized NE 119th Street/SR 503 and NE 149th Street/SR 503 intersections. The likely access scenario is discussed in further detail below.

### *County Circulation Plan Considerations*

Beyond SR 503, Clark County operates and maintains the roadway network surrounding the site including key north-south and east-west roadways. Clark County's SR 503 Circulation Plan includes transportation system needs for the site. Exhibit 1 illustrates the County's Circulation Plan. This plan seeks to develop a network of east-west and north south County roadways that augment SR 503 and offer alternate access to most properties with SR 503 frontage (facilitating restricted driveway access to SR 503). Note that the approximate boundary of the proposed industrial land bank is shaded light yellow in Exhibit 1 for ease of identification.

**Exhibit 1 SR 503 Circulation Plan**

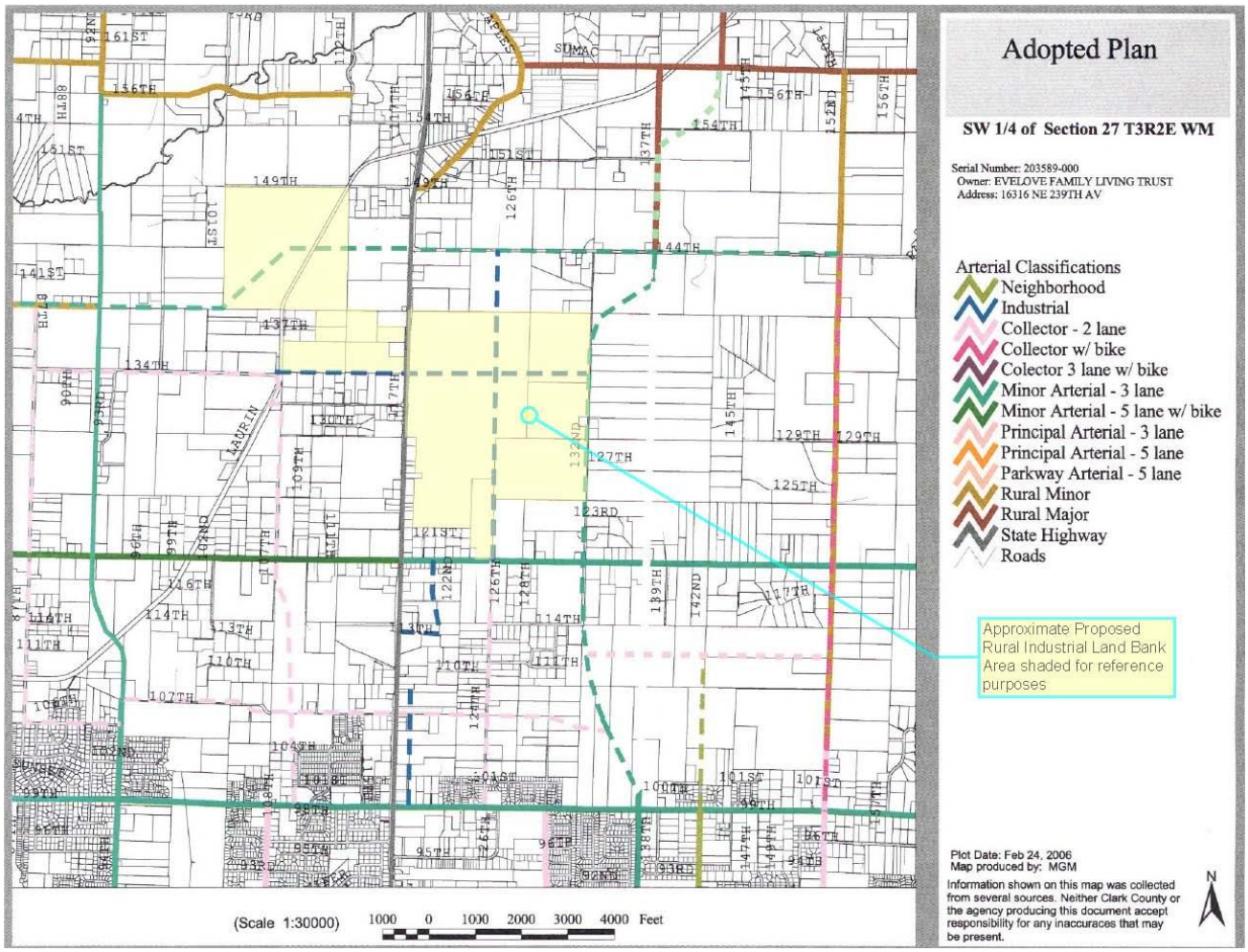


**Image Source: Clark County, http://www.clark.wa.gov/planning/Transportation/sr503.html**

Exhibit 1 depicts a new north-south industrial roadway (approximate location of NE 124th – NE 126th Avenue) traveling through the proposed land bank area located east of SR 503. This new roadway would provide connectivity between NE 119th Street and NE 144th Street. Similarly, a new east-west industrial roadway (approximate location of NE 134th Street) is shown through the proposed land bank area linking SR 503 and NE 132nd Avenue. West of SR 503, the circulation plan identifies the extension of NE 144th Street and NE 134th Street from SR 503 continued to points west of the study area and NE 93rd Street. Finally, the plan shows an upgrade of SE 132nd Avenue to minor arterial standards along the eastern site frontage with connections continuing south to NE 99th Street and north to NE 144th Street. While not specifically highlighted by the circulation plan, WSDOT's minimum half-mile spacing criteria for signalized intersections along SR 503 effectively limits a potential future signal location to NE 134th Street given the existing signalized intersections at NE 119th Street and NE 149th Street-NE Caples Road.

### *Rural Industrial Land Bank Concept Plan Transportation Considerations*

The conceptual land use plan identified by the project team is reflected in Exhibit 2 and incorporates the north-south and east-west collector facilities identified in the SR 503 Circulation Plan east of SR 503.

**Exhibit 2 Rural Industrial Land Bank Concept**

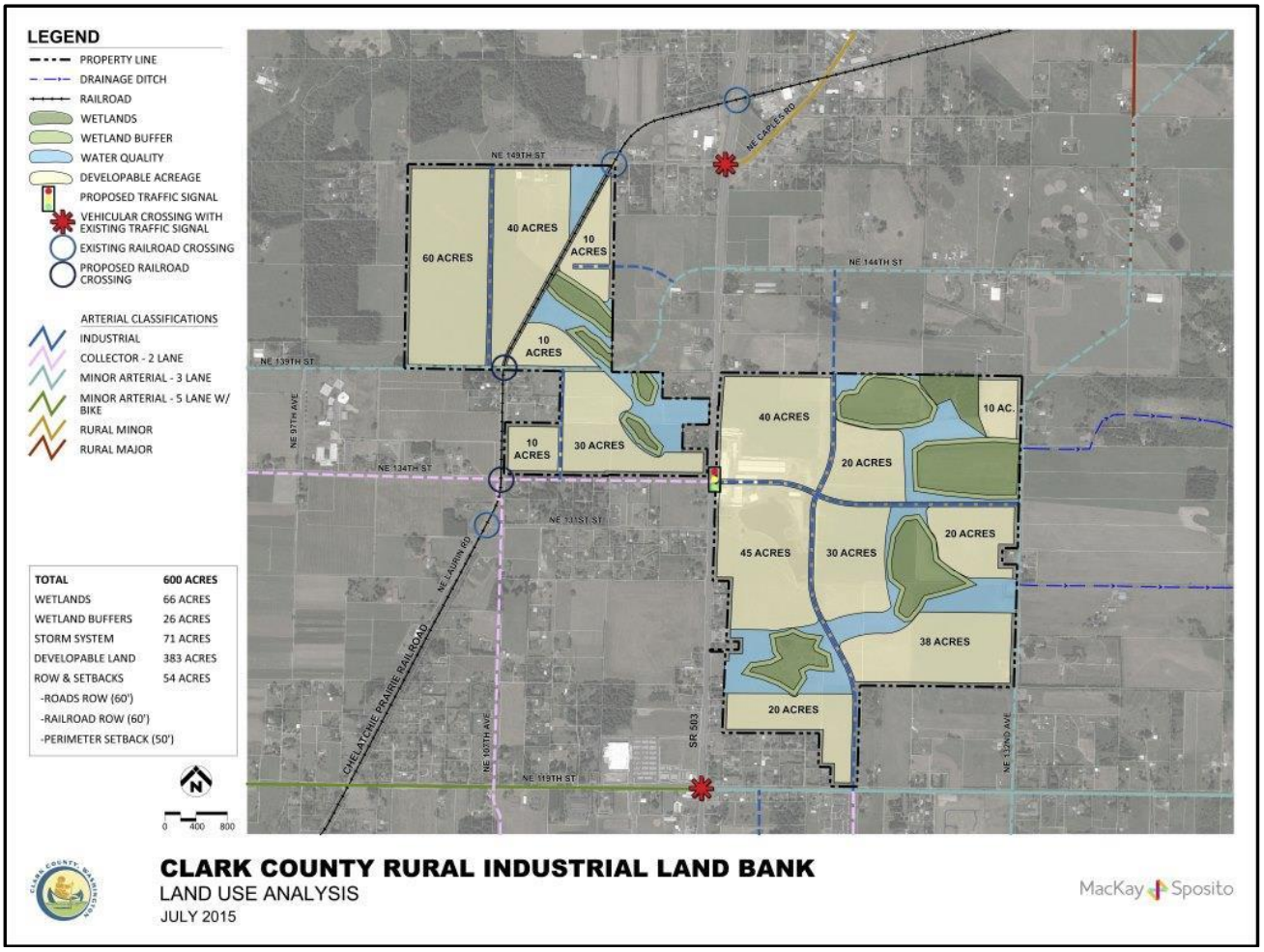


Image Source: MacKay Sposito

The southern terminus of the new north-south roadway east of SR 503 shown in Exhibit 2 would be aligned with NE 124th Avenue and could allow for signalization of the intersection with NE 119th Street if warranted. Exhibit 2 also identifies an east-west collector roadway west of SR 503 linking the existing terminus of NE 134th Street east to a new signalized intersection with SR 503 (consistent with the SR 503 Circulation Plan and WSDOT signal spacing requirements). The NE 134th Street extension west of SR 503 is shown to continue east of SR 503 to NE 132nd Avenue as a primary industrial roadway. The alignment of the new NE 134th Street east-west roadway is proposed in a manner that links the Rural Industrial Land Bank areas east and west of SR 503 while avoiding direct connection to residential housing on the west side of SR 503 (thus providing separation between existing residential homes with access oriented to NE 131st Street and future industrial traffic, particularly heavy vehicles).

West of SR 503, the NE 139th Street-NE 144th Street extension shown in the SR 503 Circulation Plan is accommodated through an alignment that maximizes developable area within the RILB properties while seeking to minimize wetland impacts. While the new NE 139th Street arterial is shown as aligned with NE 144th Street at SR 503, alignment of the roadways east and west of SR 503 may not be required. Access from NE 139th Street to SR 503 is expected to be limited to right-turns only (WSDOT's

half-mile signal spacing requirements will not accommodate signalization of the NE 144th Street/SR 503 intersection) given the intersection's close proximity to the existing signal at NE Caples Road. This limited access would likely need to be controlled by a raised median. In the case of limited access that is controlled by a median, the east and west approaches of NE 139th Street to SR 503 could be offset.

A new north-south collector is proposed between SR 503 and the Chelatchie Prairie Railroad to link NE 134th Street and NE 139th Street. This connection and a new north-south industrial roadway linking NE 139th Street to NE 149th Street west of the railroad tracks provide the RILB properties west of SR 503 (and other surrounding properties) two connections to traffic signals on SR 503 (NE 134th Street and NE 149th Street) while minimizing new crossings of the Chelatchie Prairie Railroad.

Table 2 summarizes key differences between the proposed RILB Concept and the SR 503 Circulation Plan.

**Table 2. Comparison of Land Bank Concept and SR 503 Circulation Plan Roadway Infrastructure**

| SR 503 Circulation Plan | Rural Industrial Land Bank Concept | Notes |
|---|---|---|
| East-west arterial at NE 119th Street with existing traffic signal at SR 503. | Assumes east-west arterial at NE 119th Street with existing traffic signal at SR 503. | Proposal consistent with plan. |
| East-west industrial roadway at NE 134th Street with implied traffic signal at SR 503 and connection to existing NE 134th Street at NE Laurin Road (including new railroad crossing). | Provides east-west NE 134th Street corridor. Assumes industrial roadway designation east of SR 503, traffic signal at SR 503, and collector designation to existing NE 134th Street collector at NE Laurin Road (including new railroad crossing). | Proposal consistent with plan east of SR 503.<br><br>Proposal provides *collector* west of SR 503 (avoids linking SR 503 arterial with existing NE 134th Street collector via an industrial section). |
| Assumes east-west minor arterial at NE 144th Street with implied traffic signal at SR 503 and new railroad crossing. | Completes NE 139th Street-NE 144th Street corridor connection with and new railroad crossing. Proposal assumes right-turn only access at NE 144th Street/SR 503 and provides north-south collector linking NE 134th Street and NE 139th Street as well as north-south industrial roadway designation linking NE 149th Street and NE 139th Street. | Proposal consistent with plan. Proposal supplements plan with north-south connectivity between NE 134th Street, NE 139th Street, and NE 149th Street given right-turn only restrictions at NE 149th Street/SR 503 intersection. |

The changes summarized in Table 2 are proposed in an effort to capitalize on the vision offered by the SR 503 Circulation Plan while also:

- Minimizing interaction of future RILB trips (particularly heavy vehicles/freight) with existing residential traffic;
- Complying with WSDOT traffic signal spacing requirements along SR 503 while capitalizing on existing signalized intersection locations;
- Providing connectivity options both within the RILB as well as to adjacent neighborhoods;
- Providing evenly spaced future traffic signals along SR 503 (to allow for future traffic signal coordination/progression); and
- Minimizing the number of potential new crossings of the Chelatchie Prairie Railroad.

### *SR 503 Access Considerations*

WSDOT regulates access to SR 503 and will be responsible for the operations and maintenance of future intersections and traffic signals along the roadway. WSDOT seeks to maintain north-south mobility and safety along SR 503 and will seek to minimize the number of new driveways and traffic signals along SR 503. The following considerations were accounted for while developing the transportation concept shown in Exhibit 2.

- Existing traffic signals are located on SR 503 at NE 119th Street and NE 149th Street and their location will be preserved in the future.
- As of 2014, approximately 24,000 to 26,000 vehicles per day were projected to traverse the segment of SR 503 between NE 119th Street and NE 149th Street per data in WSDOT's *2014 Annual Traffic Report.*
- Additional future lanes are anticipated to serve future travel demand at the NE 119th Street traffic signal and are expected to be required of future development projects impacting the intersection. This intersection is projected to operate near capacity during the weekday PM peak hour based on recent concurrency approvals[2] and is expected to receive additional turn lane improvements to add capacity in the future (likely to be provided in conjunction with private development).
- The NE 149th Street-NE Caples Road traffic signal operates well under capacity today based on recent studies in the area. It appears that additional turn lane improvements at the

[2] *Brush Prairie Mini Storage Transportation Impact Analysis*, May 2014, projects the SR 503/NE 119th Street intersection will operate at Level of Service "D" and a volume-to-capacity ratio of 0.85 during the weekday AM peak hour and a Level of Service "E" and a volume-to-capacity ratio of 0.95 during the weekday PM peak hour upon buildout of approved projects.

existing intersection could be provided to add future capacity (likely to be provided in conjunction with private development).

- Future traffic signals along SR 503 will require WSDOT approval. Only one additional signal will be allowed between NE 119th Street and NE 149th Street-NE Caples Road to provide for continued north-south mobility on SR 503.
- Provision of a traffic signal at NE 134th Street approximately mid-way between the existing traffic signals at NE 119th Street and NE 149th Street would offer preferred signal spacing for traffic progression purposes and satisfy WSDOT's minimum half-mile signal spacing criteria.
- WSDOT has indicated NE 144th Street will not be signalized at SR 503.
- A continuous center left-turn lane is currently provided on SR 503 between NE 149th Street and roughly NE 123rd Street. Based on WSDOT access management goals, it is expected that future driveways along the roadway (if allowed) will be restricted to right-turns only and that raised median treatments will be installed at non-signalized locations. Right-turn deceleration lanes should also be anticipated as a requirement at future driveways.
- Primary access to the RILB area should be sought via County roadways as opposed to direct connections to SR 503.

## Railroad Elements

The Chelatchie Prairie Railroad will directly traverse the western portion of the RILB area. The railroad crosses SR 503 north of NE 149th Street as shown in Exhibit 2.

We expect that future land bank tenants seeking railroad access would be best served if located on the west side of SR 503 where rail siding connections could be made to the existing railroad tracks. In our opinion, approval of a second at-grade railroad crossing of SR 503 to serve the eastern portion of the RILB area is unlikely. If rail access to the site area east of SR 503 is sought, such access would likely either involve a connection to the existing Chelatchie Prairie Railroad tracks located east of SR 503 (new spur line), or grade separation of a new connection over SR 503. Both options could be costly and require significant time and resources to get approvals from the railroad.

The current RILB area shown in Exhibit 2 involves two new crossings of the existing railroad tracks (one crossing at NE 134th Street and one crossing at NE 139th Street). If at-grade crossings are provided, it is expected that active warning devices including gates, lights, and audible devices will be required.

It should be noted that there is a 10-acre triangular property shown within the Rural Industrial Land Bank area directly south of NE 149th Street that is bordered by the railroad tracks to the north and west and wetlands/water quality areas to the south. The current land use plan anticipates this 10-acre property could be served by access to the east (though off-site properties). Access to the west would likely require a separate railroad crossing to serve this property and addition of another at-grade railroad crossing to serve this property may be challenging.

## Potential Off-site Mitigation Needs

In addition to the implied construction of new on-site primary and secondary commercial/industrial vehicular roadways discussed above, development of the RILB Concept has the potential to trigger off-site transportation improvements. Specific off-site transportation mitigation requirements will be determined in the future through site plan application and transportation concurrency review per the requirements of Clark County and WSDOT.

Preliminary travel demand model data was reviewed at a planning level to identify potential transportation system needs (refer to preliminary capacity assessment discussion below); however, no detailed effort to quantify off-site transportation impacts has been prepared to date. Notwithstanding a formal transportation concurrency review, at a conceptual level, off-site transportation infrastructure improvement requirements may include (but are not limited to):

- Widening of NE 149th Street along the site frontage as well as the segment east of the RILB towards SR 503, potentially including reconstruction of the existing Chelatchie Prairie Railroad grade crossing of NE 149th Street (reconstruction likely to be needed to accommodate wider travel lanes on NE 149th Street over the railroad tracks, a reconstructed railroad crossing surface with concrete panels, potential corresponding relocation of the railroad gates and warning lights, etc.)
- Turn lane improvements (additional capacity and queue storage) at the existing signalized NE 149th Street-NE Caples Road/SR 503 intersection.
- Implementation of raised median treatments along the SR 503 site frontage between NE 139th Street and NE 134th Street and between NE 134th Street and NE 119th Street (a median break will be provided for the new traffic signal at NE 134th Street), including provision of street lighting (illumination) along the new median.
- Construction of a new traffic signal on SR 503 at NE 134th Street, including potential traffic signal interconnect (communications) with existing traffic signals on SR 503 at NE 119th Street and NE 149th Street-NE Caples Road (access and new traffic signal subject to WSDOT approval).
- Construction of turn lane improvements (additional capacity and queue storage) at the existing signalized NE 119th Street/SR 503 intersection.
- Construction of a traffic signal at the NE 119th Street/NE 124th Avenue (future north-south roadway connection to NE 119th Street) intersection, including provision of eastbound and westbound left turn lanes on NE 119th Street.
- Widening or other site frontage improvements along NE 132nd Avenue, particularly at the new east-west roadway connection and at the intersections with NE 119th Street and NE 144th Street where additional turn lanes may be required.

### *Preliminary Capacity Assessment*

Southwest Washington Regional Transportation Council (RTC) prepared travel demand modeling forecasts to help identify potential transportation capacity needs associated with development of the RILB lands. Specifically, RTC prepared an analysis of roadway segment volume-to-capacity ratios in the area surrounding the site under year 2010 and 2035 conditions. Year 2035 conditions were analyzed assuming the 2004-2024 Comprehensive Plan Comprehensive Plan/zoning and were then re-analyzed assuming development of the RILB properties at a density of nine jobs per acre and assuming the new collector roadway network connections. The RTC analyses included separate transportation analysis zones for the RILB properties east and west of SR 503.

The following generalized findings were derived from the RTC modeling:

- Regional travel demand patterns in the future will continue to be primarily oriented north-south as opposed to east-west.
- The proposed road network was found to help distribute RILB-generated trips away to other roadways besides SR 503. In particular, the new 139$^{th}$ Street arterial through the RILB property west of SR 503 serves the new uses and reduces reliance on SR 503, thereby providing an overall benefit to the transportation system. In addition, this roadway is forecast to operate well under-capacity even with RILB development.
- With the proposed road network in place, there is sufficient capacity along SR 503 and County-maintained collectors and arterials in the vicinity to accommodate development of the RILB properties for industrial use.

## NEXT STEPS

The material provided in this letter should be considered as informational for planning purposes. In the future, a detailed traffic impact analysis will be required prior to site development. The traffic impact analysis will need to account for other approved in-process development, more specific site land-use assumptions, growth in regional traffic volumes as phased development occurs, and other typical study requirements. The traffic impact analysis will need to address regulatory review elements such as WSDOT's access management, safety and intersection performance requirements, Clark County's intersection performance requirements, driveway spacing standards, transportation concurrency review requirements, Transportation Demand Management measures, and other SEPA related considerations.

Please let us know if you have any questions regarding the information presented herein.