Diversified sectors of the business community have participated in this study. They range from huge international entities to one-person small businesses; high tech companies to manufacturing companies; retail to offices; art, auto, engineering, legal, medical, restaurant, real estate, services, and many more…

The business community’s participation was essential to this study. Together, their participation laid out the insight and knowledge for understanding the movement and operations of Redmond freight transportation. More importantly, the business community shed light on innovative ideas and solutions for improving Redmond freight transportation network.

With deep gratitude, the study team thanks the business community for their contribution to this study. The study team is especially grateful for the help and support from the Redmond Chamber of Commerce and Southeast Redmond area freight users.

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INTRODUCTION

In 2009 Heffron Transportation completed a Freight Mobility Study for the City of Redmond. Both the Redmond Comprehensive Plan and the Transportation Master Plan (TMP) recognize freight mobility, goods, and services (freight mobility) as a critical component of a functioning transportation system. For that reason, the City committed to completing this study when it adopted its 2005 (TMP). The outcomes of this study are: improved understanding and assessment of freight mobility in Redmond, recommendations for improving freight mobility, and an action plan for implementing study recommendations. The study area of the Freight Mobility Study is Citywide with a focus in the Southeast Redmond area (Figure 1).

Figure 1 Study area map.
The City and consultant used the following information sources in this study:
- 2008 and 2009 vehicle classification counts on Redmond streets;
- Redmond land use and employment data;
- Stakeholder comments from:
  - Interviews with major manufacturing companies;
  - A planning charrette;
  - A public open house;
  - A Citywide freight mobility survey of businesses; and
- Redmond policies, regulations, and standards.

The study addresses the following aspects of freight mobility:
- Freight users;
- Freight transportation network;
- Freight-related policies, regulations, and standards;
- Truck deliveries for businesses;
- Truck traffic volume on Redmond streets; and
- Stakeholder concerns and needs for freight mobility.

Key recommendations include:
- Updating freight policies, regulations, and standards;
- Improving roadway network for freight mobility;
- Improving intersection design and operations for better truck movements; and
- Improving communications about construction impacts.

SUMMARY OF FINDINGS

Freight Transportation Network

The City of Redmond’s freight transportation network consists entirely of trucks traveling on roadways, which include City streets and state routes. SR 520 is Redmond’s only limited access highway. SR 520 and other streets such as Redmond Way (SR 908 and SR 202) connect Redmond with other freeways including I-405, I-5, and I-90.

City streets are classified into principal, minor, and collector arterials, connectors, and local access streets. A combination of some principal and minor arterials constitute Redmond’s nine designated truck routes (Figure 2). Trucks passing through Redmond may only use truck routes and state highways. Trucks with Redmond origins or destinations may use any public street.
Redmond Freight Users

All Redmond businesses use freight to move goods and services. Even so, because Redmond is home to a variety of business types and sizes, freight use patterns vary widely. Compared to the rest of the City, Southeast Redmond has a high concentration of major businesses with substantial delivery needs. They include manufacturing companies, especially of construction equipment and materials. In addition to these manufacturing companies, other businesses with substantial delivery needs include regional retail and grocery stores and mail and package service centers including UPS and USPS distribution centers. These businesses share certain characteristics; for example, they:

- Operate on a national or international scale;
- Employ large numbers of people (in Southeast Redmond, the top eight businesses with substantial delivery needs employ about 3,700 employees\(^1\)); and,
- Depend highly on the movement of goods and services.

\(^1\) Source: Redmond Business License Database, 2008.
While large delivery and manufacturing firms no doubt exert pressure on the transportation network at key locations, the hundreds of small businesses throughout Redmond also depend on reliable movement of goods and services to thrive.

In the future, the City of Redmond expects employment related to industrial land use – and with it, truck traffic – to grow.

**Existing Redmond Freight Related Policies, Regulations, and Standards**

Redmond regulates truck movements in two ways. First, it regulates movement of trucks on City streets. Redmond Municipal Code (RMC) 10.76 regulates the movement of trucks on City streets and authorized truck routes. RMC 10.52.220 regulates truck parking on residential streets.

Redmond also regulates some land uses that typically employ trucks. These regulations do not explicitly regulate the movement of trucks. Instead, they focus on the impacts of trucks. For example, Redmond Community Development Guide 20C.70.45-020 includes noise mitigation requirements for non-residential land use development activities adjacent to residential areas in a portion of Southeast Redmond.

**Typical Truck Movement Patterns**

Typical truck movement patterns from and to businesses are extracted from the 2009 freight mobility survey. The survey was mailed to approximately 1760 businesses in addition to advertising on the City’s homepage, Redmond Reporter, and Redmond Chamber of Commerce newsletter. About 150 businesses responded to the survey and 130 businesses provided detailed information. Businesses that responded are mostly located in three areas (Figure 3). The 2009 freight mobility survey indicated the following daily and hourly truck movement patterns:

- Truck deliveries to businesses occur mostly on weekdays, with no peak day.
- Truck deliveries typically start after 6 a.m. and end by 6 p.m.
- The greatest percentage of truck deliveries occurs between 10 a.m. and 2 p.m. This pattern does not apply to some major manufacturing companies in Southeast Redmond.
- In Southeast Redmond, truck deliveries of major manufacturing companies occur evenly among the three periods...
between 6 am and 6 pm (6:00 am ~ 10:00 am, 10:00 am ~ 2:00 pm, and 2:00 pm ~ 6:00 pm).

**Truck Traffic Volume on Redmond Streets**

Truck traffic is significant on many City streets in Southeast Redmond. Daily truck traffic volumes on existing truck routes range from 410 to 1625.\(^2\) Arterials in Southeast Redmond that connect manufacturing companies with SR 520 and other major arterials have very high truck volumes. Intersections on these arterials with high truck volumes include:

- The end of SR 520: NE Union Hill Road at Avondale Road (westbound);
- NE 76th Street at Redmond Way;
- NE 76th Street at 178th Place NE; and
- NE Union Hill Road at 178th Place NE.

At these intersections, trucks account for 12-23% of total traffic in the morning peak hour, 4-10% in the midday peak hour, but just 1-5% in the afternoon peak hour.

**Stakeholder Concerns and Needs for Freight Mobility**

Concerns, needs, and ideas from stakeholders were collected through interviews with representatives of major manufacturing companies, a 2009 Citywide freight mobility survey, a February 2009 planning charrette, and a May 2009 open house. Stakeholders identified concerns and needs for both system level and spot improvements. Common themes among concerns and needs included:

- **Congestion.** Construction activities and roadway bottlenecks in Downtown and Southeast Redmond cause delay and direct economic loss for truckers.

- **Intersection design and operations.** Intersection signal timing, intersection turning radii, and roundabout design need to accommodate truck movements.

- **Access and circulation.** It is difficult for large trucks to access and circulate some commercial sites during the day. Access and circulation for large trucks should be considered during private development site design.

- **Connection.** Improving the street grid network in Southeast Redmond will help provide alternate connections for trucks, which in turn will alleviate congestion.

- **Truck parking and loading/unloading.** Truck parking and loading/unloading should be considered for both streets and during private development site design.

- **Unclear noise restriction.** Noise restrictions for certain types of land uses need to be clarified.

- **Other.** Trucks should be considered in maintenance, snow removal, and emergency plans.

\(^2\) The average daily truck traffic volume is not available on one of the existing truck routes, NE 51st Street between 148th Avenue NE and SR 520.
RECOMMENDATIONS

Establish a Two-Tier Truck Route System
Designating a two-tier truck route system is recommended including “through truck routes” and “truck access routes (see Figure 4).” Through truck routes will accommodate through truck traffic in Redmond. In order to have a complete and connected street network for through truck traffic, two types of arterials need to be designated as through truck routes:

1. Arterials that directly connect with regional roadways; and
2. Arterials that currently have high volumes of trucks.

Figure 4 Proposed truck routes.

In addition to truck routes designated in the current truck route ordinance, other arterials recommended to be designated through truck routes are:
- NE 90th Street from Willows Road to 154th Avenue NE
• 154th Avenue NE from NE 90th Street to West Lake Sammamish Parkway
• 148th Avenue NE from Redmond Way to Willows Road
• Willows Road from NE 90th Street to the City limit
• NE Union Hill Road for its entire length in Redmond

Truck access routes connect major industrial and commercial centers with regional roadway network and through truck routes. The intent of designating truck access routes is to design and maintain these routes with appropriate street design standards, e.g., pavement depth, which correspond to the movement and load of trucks. Street design standards for truck access routes are not intended to increase truck volumes on truck access routes. Nor are they intended to increase the speed of trucks on truck access routes. Therefore, the development and application of street design standards need to be context sensitive especially within residential areas. The following streets within the Southeast Redmond area are recommended to be designated as truck access routes:
• NE 76th Street from SR 520 east to its terminus
• 178th Place NE/180th Ave NE from Union Hill Road to Redmond Way
• 185th Avenue NE from Union Hill Road (with future extension) to Redmond Way
• 188th Avenue NE from Union Hill Road (with future extension) to Redmond Way
• NE 70th Street from Redmond Way west to its terminus
• 176th Avenue NE from NE 65th Street to NE 70th Street

Update the Truck Route Ordinance

It is recommended that the current truck route ordinance be updated to reflect the proposed two-tier truck route system. Regulation of overweight and oversize trucks needs to be part of the updated ordinance. One option is to allow overweight and oversize trucks on Redmond truck routes only with a valid WSDOT permit. The following changes will also be made:

• **Allow Limited On-street Truck Parking Areas.** Truck parking on streets within industrial areas allows for flexibility in truck access and staging when access conditions are constrained. However, on-street truck parking should only be allowed where it does not block sight lines to driveways or create congestion. We recommend that code provisions be added to strengthen the City’s ability to restrict or prohibit on-street truck parking where needed.

• **Restrict Truck Parking in Residential Areas.** We recommend restricting truck parking in residential areas between 10 p.m. and 7 a.m. except by special permit. Such prohibition would ensure nearby residences that trucks could neither drive through nor park in residential areas overnight. For an example, see City of Bellevue Municipal Code Chapter 11.70.

Establish or Update Other Freight Policies, Regulations, and Standards

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3 The truck access route designation of 188th Avenue NE will be evaluated once the internal grid network in this area is built including 185th Avenue NE and NE 76th Street.
Apart from the truck route ordinance, other freight related policies, regulations, and standards include freight policies in the TMP, street design standards for trucks, and various regulations related to truck movement in the Redmond Community Development Guide. We recommend the following:

- Update the TMP to include freight policies, programs, and projects such as designating and prioritizing truck routes in the Pavement Management Program.
- Establish street design intent and criteria to accommodate truck movements on streets that have significant truck traffic, such as through truck routes and truck access routes. Design standards should consider the design vehicle, intersection turning radii, lateral clearance, and pavement type and depth.
- Update relevant land use development regulations for improved site access and circulation of trucks. One tool that can be used to ensure adequate site access and circulation of trucks is a truck turning template.
- Clarify noise regulations related with truck activities.
- Consider the needs of trucks in maintenance, snow removal, and emergency plans.
- Establish truck parking and loading/unloading zones.

**Improve Roadway Network**

- Improve the street grid network in Southeast Redmond to provide alternate routes and relieve congestion.
- Improve NE 76th Street to better accommodate trucks.

**Improve Intersection Design and Operations for Better Truck Movements**

- Improve signal timing at the intersection of Avondale Road and NE Union Hill Road to improve the westbound left turn movement from NE Union Hill Road to SR 520;
- Improve the geometry of the intersection of Redmond Way and 185th Avenue NE;
- Increase the turning radius for:
  - The intersection of NE 76th Street and 178th Place NE; and
  - At NE 70th Street and 176th Avenue NE.

**Improve Communication about Construction Impacts**

Better communication about construction impacts can save time and money. The City of Redmond Public Works, Planning, and Information Services Departments worked jointly on a pilot communication program on the Cleveland Street sewer replacement project. This pilot communication program includes:

- A frequently updated website;
- A sign-up system for interested parties to receive the latest status via email or Twitter;
- A complaint/issues tracking system that will address issues by identifying the respondent, indicating the resolution and tracking the time to resolution;
- Variable message signs that alert travelers on the road; and
- Personal visits to affected businesses.

The City is expected to expand the communication program to all future construction projects.
ACTION PLAN

We identify four categories of actions to implement study recommendations: ordinances and council actions, roadway improvement recommendations, staff and consultant work, and funding pursuit.

Ordinances and Council Actions
a. Update the truck route ordinance. The truck route ordinance will be updated to include the two tier truck route system and the regulation of overweight and oversize trucks.
b. Approve the long term transportation plan for the greater Southeast Redmond area including projects specifically benefitting freight mobility.
c. Consider freight mobility as an explicit criteria and priority in the TMP update starting in 2010.
d. Evaluate establishing a freight mobility improvement program for freight mobility projects throughout the City.

Roadway Improvement Recommendations
e. Roadway improvements recommended from this study were incorporated into the Greater Southeast Redmond Area Transportation Study project evaluation process.

Staff and Consultant Work
f. Update street design standards to better accommodate trucks, such as intersection turning radii, roadway side clearance, and pavement depth.
g. Consider truck parking and loading/unloading zones in Downtown Redmond as part of the Downtown East and West Corridor Final Design.
h. Improve signal timing at various signalized intersections as part of daily traffic operations activities.
i. Expand the pilot communication program to all construction projects in the City.
j. Consider the needs of trucks in maintenance, snow removal, and emergency plans.
k. Consider parking lot design standards with urban design standards and truck needs as part of Redmond Community Development Guide (RCDG) update.
l. Clarify the noise ordinance related with truck activities as part of the RCDG update.
m. Consider truck needs in the preliminary design of NE 76th Street Corridor.

Funding Pursuit
n. Update the classification of certain City streets in the State of Washington Freight Goods and Transportation System (FGTS). Streets that meet certain tonnage requirements are eligible to compete for Freight Mobility Strategic Investment Board (FMSIB) funding.

Below is a summary of the action plan with timelines for each action.
### Table 1 Action Plan – Years of Action Initiation

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<tr>
<th>Action Plan</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
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<tbody>
<tr>
<td><strong>Ordinance and Council Actions</strong></td>
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<td>a. Ordinance update</td>
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<td>Truck Route update</td>
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<td>b. Approve transportation plan with freight projects</td>
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<td>c. Explicitly consider freight mobility in the TMP update</td>
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<td>d. Evaluate establishing a freight mobility improvement program</td>
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<td><strong>Roadway Improvement Recommendations</strong></td>
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<td>e. Evaluate roadway improvement recommendations</td>
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<td><strong>Staff and Consultant Work</strong></td>
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<td>f. Street design standards update for trucks</td>
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<td>g. Downtown truck loading/unloading zone considerations</td>
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<td>h. Intersection signal timing improvement at key freight corridors and intersections (ongoing)</td>
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<td>i. Expand communications with the public on traffic impacts from construction</td>
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<td>Truck needs consideration in maintenance and emergence plan (ongoing)</td>
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<td>j.</td>
<td>Truck needs consideration in parking lot design standards as part of the RCDG rewrite</td>
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<td>k.</td>
<td>Clarify the noise ordinance related to trucks as part of the RCDG rewrite</td>
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<td>l.</td>
<td>Truck needs consideration in NE 76th Street Design</td>
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<td>m.</td>
<td>Pursue freight related funding (ground work initiated, ongoing)</td>
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<td>Funding Pursuit</td>
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Funding Pursuit