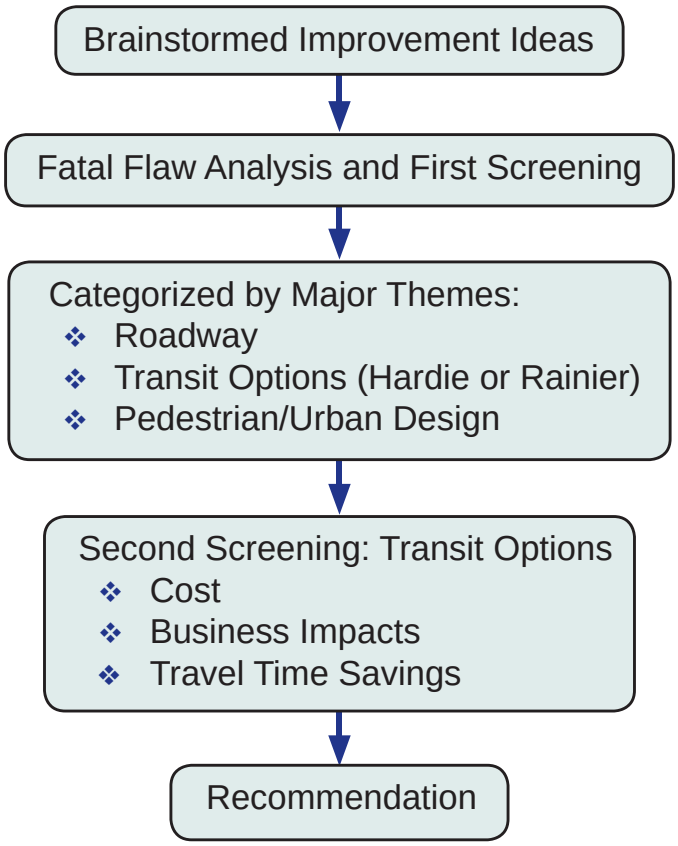
Chapter 4. Identification and Evaluation of Improvement Options

Steps to Develop Recommendation

Understanding potential future traffic conditions provided a base from which to generate solutions. **Figure 4-1** illustrates the process by which the project recommendation was developed. As a first step, the project team solicited preliminary ideas for potential improvements from a public open house and the project steering committee. **Appendix 4-A** includes four illustrations showing the full range of brainstormed ideas.

Figure 4-1. Process to Develop Recommendation



Fatal Flaw Analysis and First Screening

The project steering committee defined the following areas of emphasis to use in this first-level screening for the fatal flaw analysis:

AREAS OF EMPHASIS

- Evaluate options to improve the travel conditions for all modes of transportation.
- Focus on easing traffic congestion and reducing bus travel delays at the intersection of Grady Way and Rainier Avenue.
- Leave Shattuck Avenue as a local access street.
- Explore ways to increase the use of Hardie Avenue.
- Assume that Hardie Avenue SW as a bicycle route is valid.
- Do not pursue bicycle facilities on Rainier Avenue south of Airport Way.
- Examine ways to accommodate the needs of pedestrian travel on Rainier Avenue.
- Level of Service
  - Use the Highway Capacity Manual LOS standard as an evaluation criterion.
  - The study recommendations must support, maintain or improve the City of Renton's LOS index.
  - Any alternatives that would not make a positive contribution toward improving the City of Renton's LOS index should not be considered.
- Road Widening
  - Seek to avoid widening of Rainier Avenue to an eight or nine-lane roadway.
  - Emphasize the use of the existing curb-to-curb width, with increased people carrying capacity.
  - Allow localized expansion with creative ideas, e.g. turn lanes, queue bypasses, and/or intelligence transportation system solutions.

PERFORMANCE OBJECTIVES

The steering committee also established the following set of performance objectives for the ultimate set of project recommendations.

- Enhance transit mobility
- Enhance pedestrian mobility
- Improve safety
- Reduce roadway traffic congestion
- Mitigate environmental impacts
- Support land use objectives
- Feasible to implement
- Receive strong community support

Major Themes

During the course of review and evaluation, several ideas emerged for further analysis and a number were dropped from further consideration as not meeting the first level screening criteria and/or the performance objectives. **Appendix 4-B** lists the ideas eliminated from further consideration and the rationale for so doing. The remaining ideas were subsequently categorized and considered by major themes, with a key remaining decision emerging as to whether to use Hardie Avenue or Rainier Avenue for improved bus travel time. **Figure 4-2** illustrates these improvement options by category.

- Roadway Improvements
- Transit – Rainier Route
- Transit – Hardie Route
- Pedestrian/Urban Design Improvements

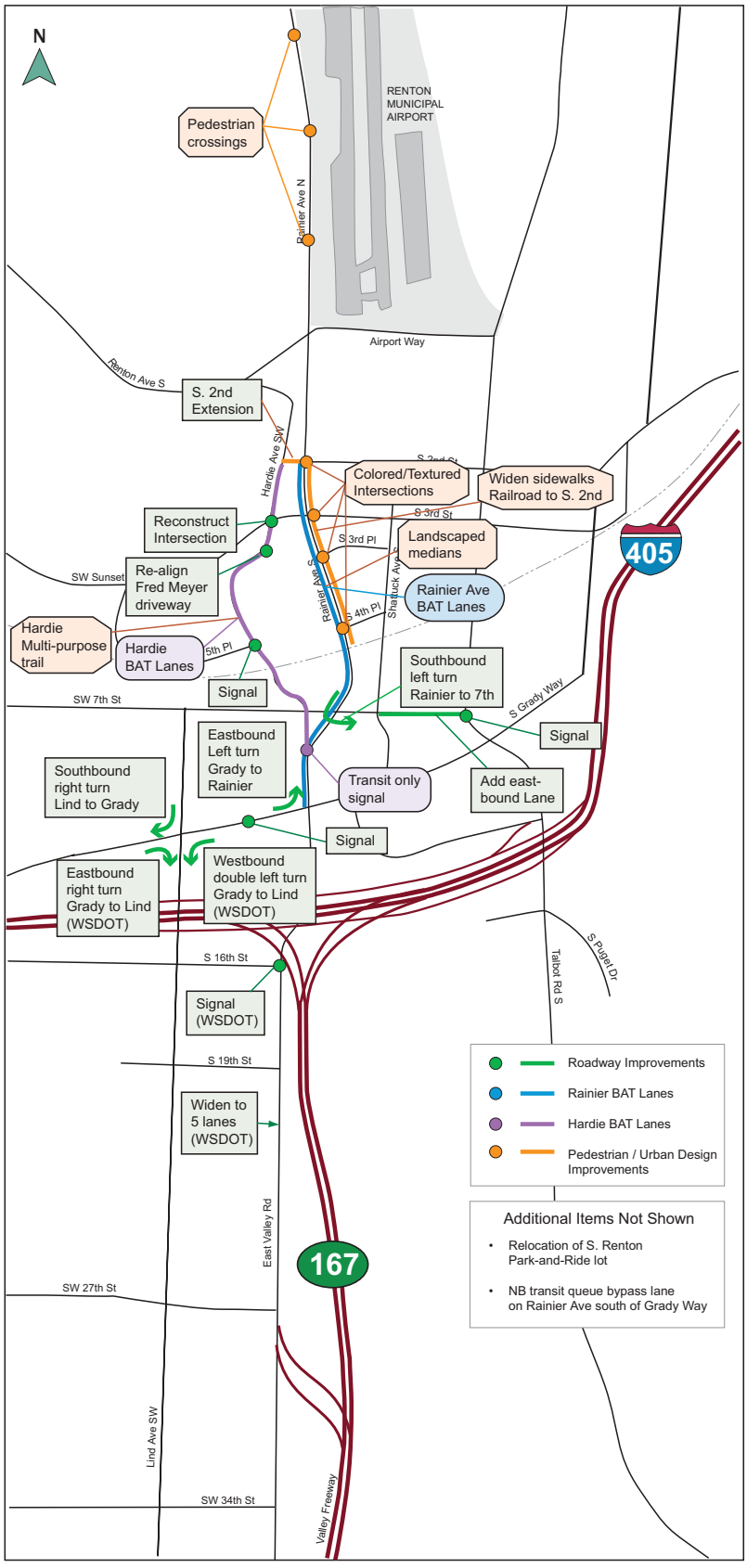
ROADWAY IMPROVEMENT OPTIONS

- South Grady Way:
  - Eastbound-to-Northbound left turn lane at the South Grady Way/Rainier Avenue South intersection
  - Eastbound-to-Southbound right turn lane at the South Grady Way/Lind Avenue Southwest intersection (WSDOT proposed improvement included in Baseline)
  - Westbound-to-Southbound double left turn lanes on South Grady Way/Lind Avenue Southwest intersection (WSDOT proposed improvement included in Baseline)
  - Signal at approximately mid-point between Rainier Avenue South and Lind Avenue Southwest on South Grady Way
- Rainier Avenue South:
  - Southbound-to-Eastbound additional left turn lane at the South 7th Street/Rainier Avenue South intersection
- South 7th Street:
  - Widening to two eastbound lanes between Rainier Avenue South to Talbot Road South
  - Signal at the South 7th Street/ Talbot Road South intersection
- Lind Avenue Southwest:
  - Southbound right turn lane at the Lind Avenue Southwest/ South Grady Way intersection
- East Valley Road:
  - Widening to 5 lanes (WSDOT included in 2030 Baseline)
  - Signal at Southwest 16th Street (WSDOT included in 2030 Baseline)

(East Valley Road improvements may not be needed with the revised I-405 Master Plan.)

Driving on Southbound Left Turn Lane Approaching Grady Way/ Rainier Avenue Intersection

Figure 4-2. Rainier Avenue Corridor Improvement Options



TRANSIT IMPROVEMENTS- RAINIER ROUTE OPTION

- Rainier Avenue South:
  - Northbound transit-only queue bypass lane south of South Grady Way
  - Business Access Transit (BAT) lanes between South 2nd Street and South Grady Way
  - Southbound BAT lane from South 2nd Street to South Grady Way

TRANSIT IMPROVEMENTS - HARDIE ROUTE OPTION

- Downtown access:
  - Two-way streets on South 2nd Street and South 3rd Street
  - South 2nd Street extension from Rainer Avenue South to Hardie Avenue Southwest
- Hardie Avenue Southwest:
  - BAT lanes between South 2nd Street and Rainier Avenue South
  - Upgrading between South 2nd Street extension and Sunset Boulevard with curbs, gutters and sidewalks
  - Four-legged intersection at Hardie Avenue Southwest and Sunset Boulevard
  - Transit activated signal at the Rainier Avenue South and Hardie Avenue Southwest intersection
  - Signal at Southwest 5th Place
- South Renton Park and Ride Lot
  - Relocation of South Renton Park and Ride Lot to the vicinity of the Hardie Avenue Southwest/ Southwest 7th Street intersection

Hardie Avenue SW

PEDESTRIAN/URBAN DESIGN IMPROVEMENT OPTIONS

Potential Improvements to the Corridor

Sidewalks are probably the most significant urban design improvement to be made along the corridor. Sidewalks should be at least 8 feet in width, not including street trees or planting strips. There should be buffers (planting strips, etc.) between sidewalks and the roadway, to offer safety from traffic and a more pleasant experience. Businesses that are set back from the street should provide a clear and marked pathway to sidewalks.

Crosswalks at Intersections. Currently there are adequate crosswalks, traffic islands, and pedestrian signals at major intersections. However, there is not always enough time for pedestrians to cross, nor is there enough safe distance between stopped traffic and crosswalks. Additionally, adequate signage before right-hand turns is needed, such as 'yield to pedestrians.' Traffic islands and corners could be made more comfortable for waiting pedestrians as well, with landscaping or street furniture.

In conjunction with future development, it would also be ideal to create mid-block cross-walks, with either a traffic signal or street median.

Pedestrian Amenities include street lighting (at pedestrian scale), street furniture such as seating and trash receptacles, bike racks, bus shelters, pedestrian signage for businesses, and art. These features are most effective where pedestrians have reason to travel, such between bus stops and businesses, schools, theaters, etc. In particular, the area between 2nd Street and the train bridge would need these services.

Many cities incorporate a theme or aesthetic improvement in pedestrian zones, such as artistic lamp posts, seasonal hanging baskets, banners, or others. Such improvements are noticeable to pedestrian patrons and vehicular traffic alike.

Street Trees. There are several stretches of existing street trees, and the disparity of other areas along the corridor is obvious. Trees shield pedestrians from sun, wind, noise, and surrounding nuisances such as fast traffic or large parking lots. They counter pollution. They should line all city streets, in a variety of size and species, and with an understanding of the lifespan of existing mature trees.

Signage. Business signage along auto-oriented roads is usually large and tall. However, the location and size of signs along busy roads can be made to maintain a certain character and even slow traffic while continuing to serve as locators. Especially in areas of the corridor that are sensitive to pedestrians, signs should be located closer to the ground as 'monument' signs, and no taller than the tree canopy.

Several vintage pole signs are found in the northern part of the corridor. One possibility would be to maintain these signs and cultivate a subtle character in this 'district.'

Focus Area on Rainier Avenue South: South 2nd Street to South 4th Place

Vacancies / Redevelopment Potential . A cursory study was done of the value of existing properties and structures. If a property's improvement value equaled less than half of the property's land value, then the property was considered redevelopable. Vacant buildings were also considered redevelopable. The study was undertaken in order to find a pattern or single area that could be focused upon for improvement, such as buildings that front the street with parking behind. The results showed redevelopment opportunities scattered along the corridor, suggesting that change would be gradual and possibly mismatched at times. However, a focus area was chosen between 2nd Street and 4th Place, which focuses improvements in the area of greatest potential and need.

In summary, pedestrian and urban design options along Rainier Avenue South include:

- Reduce traffic lanes to 11 feet or reduce number of lanes
- Planting strips and wider sidewalks, and locate in-fill buildings at the edge of the sidewalks
- Textured and colored materials for street crosswalks
- Landscaped medians
- Pedestrian-scale streetlights
- Driveway access consolidations
- Mid-block pedestrian crossings with in-pavement light and landscaped median north of Airport Way

Second Screening

ROADWAY AND PEDESTRIAN/URBAN DESIGN IMPROVEMENTS

The potential roadway and pedestrian/urban design improvements were evaluated against the performance objectives previously identified by the steering committee, as summarized in **Table 4-1**. Nearly all of the improvements met one or more of the performance objectives, but several emerged as needing additional work prior to implementation. In most cases, this referred to additional coordination with WSDOT with respect to whether the state's future plans for I-405 would require modifications and/or issues around cost-sharing. A few of the pedestrian/urban design ideas, e.g. driveway access consolidation, zero-set back in-fill and pedestrian scale streetlights, would require additional work with property owners and/or additional in-house coordination of land use, economic development and transportation concerns.

TRANSIT ALTERNATIVES (HARDIE AVENUE BAT LANES VS RAINIER AVENUE BAT LANES)

A separate comparative evaluation between the two alternative transit options focused on four criteria:

- Cost
- Travel Time Savings
- Business Impacts
- Pedestrian Crossings

Table 4-1. Second Screening of Roadway and Pedestrian/Urban Design Improvements

			Enhance transit mobility	Enhance pedestrian mobility	Improve safety	Reduce roadway traffic congestion	Mitigate environmental impacts	Support land use objectives	Implementation feasibility	Community support
Grady Way	Eastbound-to-Northbound left turn lane at the South Grady Way/Rainier Avenue South intersection	Roadway				●		●	●	
	Eastbound-to-Southbound right turn lane at the South Grady Way/Lind Avenue Southwest intersection (WSDOT proposed improvement)	Roadway			●	●		●	●	
	Westbound-to-Southbound double left turn lanes on South Grady Way/Lind Avenue Southwest intersection (WSDOT)	Roadway			●	●		●	●	
	Signal at approximately mid-point between Rainier Avenue South and Lind Avenue Southwest on South Grady Way	Roadway				●		○	○	○
South 7th Street	Widening to two lanes between Rainier Avenue South to Talbot Road South	Roadway				●		◎	◎	
	Signal at the South 7th Street/ Shattuck Avenue South intersection	Roadway		◎		●			●	
	Signal at the South 7th Street/ Talbot Road South intersection	Roadway		◎		●			●	
Lind Avenue Southwest	Southbound right turn lane at the Lind Avenue Southwest/ South Grady Way intersection	Roadway				●		●	◎	
East Valley Road	Widening to 5 lanes (WSDOT)	Roadway	◎			●		●	●	
	Signal at Southwest 16th Street (WSDOT)	Roadway	◎		●	●		●	●	
Hardie Avenue	Multipurpose Trail	Pedestrian/ Urban Design		●				●		
	Signal at SW 5th Place	Pedestrian/ Transit				●		●	●	●
Rainier Avenue South	Southbound-to-Eastbound left turn lane at the South 7th Street/Rainier Avenue South intersection	Roadway		○		●		◎	○	
Rainier Avenue South	Reduce traffic lanes to 11 feet or reduce lanes	Pedestrian/ Urban Design	○	◎						
	4-foot planting strips and 8-feet sidewalks, and locate in-fill buildings at the edge of the sidewalks	Pedestrian/ Urban Design		●	◎					●
	Textured and colored materials for street crosswalk	Pedestrian/ Urban Design		◎	◎					●
	Landscaped medians	Pedestrian/ Urban Design		◎	●	○				
	Pedestrian-scale streetlights	Pedestrian/ Urban Design		●						●
	Driveway access consolidations	Pedestrian/ Urban Design		◎	◎	◎			○	○
	Mid-block pedestrian crossings with in-pavement light and landscaped median north of Airport Way	Pedestrian/ Urban Design		●	●					●

● Supports criterion
◎ Support criterion but needs more work
○ Does not support criterion

Table 4-2 below compares the costs of the two BAT lane options and also shows the difference between two-way and one-way (southbound) business access transit lanes. The Rainier Avenue options are more expensive than Hardie Avenue, primarily due to greater right of way impacts.

Table 4-2. Planning Level Cost Estimates

Rainier Avenue BAT Lane Concept		Hardie Avenue BAT Lane Concept	
Northbound and Southbound	**Southbound Only**	**Northbound and Southbound**	**Southbound Only**
Total cost estimate: $40.6 million Construction: $17.6 million Right of way: $17.8 million Engineering: $5.2 million	**Total cost estimate: $32 million Construction: $16.2 million Right of way: $11 million Engineering: $4.8 million**	**Total cost estimate: $32.2 million Construction: $18.7 million Right of way: $8.0 million Engineering: $5.5 million**	**Total cost estimate: $28.9 million Construction $17.4 million Right of way: $6.4 million Engineering: $5.1 million**

Table 4-3 compares the transit travel time savings of the two alignments for the PM peak hour between South Grady Way and South 2nd Street. The "no action" travel times on Rainier Avenue South in 2030 are projected to be three minutes, northbound, and nine minutes, southbound. All options provide some travel time savings compared to the 2030 no action alternative. Both southbound business access transit lanes provide about seven minutes in travel time savings, with a southbound Rainier Avenue South business access transit lane saving about 30 seconds more than the Hardie Avenue Southwest concept, and a northbound Rainier Avenue South business access transit lane saving about 45 seconds more than one on northbound Hardie Avenue Southwest.

Table 4-3. Comparisons of Transit Travel Time Savings (Transit Travel Time Between South 2nd Street and South Grady Way)

Rainier Avenue BAT Lane Concept		Hardie Avenue BAT Lane Concept	
Northbound and Southbound	**Southbound Only**	**Northbound and Southbound**	**Southbound Only**
Estimated bus travel time reduction: NB 1 1/2 minutes SB 7 1/3 minutes	**Estimated bus travel time reduction: SB 7 1/3 minutes**	**Estimated bus travel time reduction: NB ¾ minutes SB 6 3/4 minutes**	**Estimated bus travel time reduction SB 6 3/4 minutes**

Table 4-4 compares the business impacts between the Rainier and Hardie business access transit lane opations. A southbound business access transit lane on Rainier Avenue would require 70% more additional right of way than a similar lane on Hardie Avenue (203,000 square feet vs. 119,000). The Southbound Rainier BAT lane would also require removal or relocation of 12 businesses, while the Hardie alignment would require removal or relocation of 4 businesses and 1 residential building.

Building both north- and southbound BAT lanes would affect 18 businesses on Rainier Avenue and 4 on Hardie, plus 1 residential building on Hardie. The Rainier alignment would also require about twice as much additional right of way as would the Hardie alignment (325,000 square feet vs. 163,000 square feet).

Table 4-4. Comparisons of Impacts on Businesses

Rainier Avenue BAT Lane Concept		Hardie Avenue BAT Lane Concept	
Northbound and Southbound	**Southbound Only**	**Northbound and Southbound**	**Southbound Only**
9 commercial buildings to be removed 9 businesses to be relocated 100 parking spaces to be removed Acquire 325,000 square feet for right-of-way	6 commercial buildings to be removed 6 businesses to be relocated 50 parking spaces to be removed Acquire 203,000 square feet for right-of-way	1 commercial building to be removed 1 residential building to be removed 3 businesses to be relocated 100 parking spaces to be removed Acquire 163,000 square feet for right-of-way	1 commercial building to be removed 1 residential building to be removed 3 businesses to be relocated 60 parking spaces to be removed Acquire 119,000 square feet for right-of-way

Table 4-5 shows the final point of comparison between the two transit options, pedestrian circulation. Adding business access transit lanes on Rainier Avenue would create a very wide roadway (8 lanes; 9 lanes in some places) that would be very difficult for pedestrians to cross. Hardie Avenue would be more pedestrian-friendly 4/5 lane roadway. In addition, if Rainier Avenue remains its current width, any pedestrian enhancements will be more effective than with a wider roadway.

Table 4-5. Comparisons of Pedestrian Circulation

Rainier Avenue BAT Lane Concept	Hardie Avenue BAT Lane Concept
Increased difficulty for pedestrians crossing Rainier Ave due to increased curb to curb width (8/9 lane crossings) Expansion of an auto-dominant environment, discouraging pedestrian travel	Minimizes impacts to pedestrian travels across Rainier Ave Enhances pedestrian travel along Hardie Ave Makes pedestrian improvements along Rainier Avenue more effective