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King County
Department of Transportation
METRO TRANSIT

TECHNICAL REPORT

Projected Transit Facility Growth 2005 – 2025

A study on the optimal King County sub-area location for the Facilities Maintenance base

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This technical report supplements the main planning study, "North Lake Union Facilities Maintenance Relocation Study," July 2005 and the contents contained in the report should not be construed independently from the primary study goals of the parent document

Introduction

This report looks at the potential growth of transit facilities in King County over the next 20 years to 2025. The estimated number of facilities is based on Metro's Six-Year Transit Plan that forecasts future transit service in three sub-areas of the county -- West, East and South. The purpose is to analyze the effect on relocating the Facilities Maintenance (FM) workgroup to a particular sub-area where the most growth in facilities is expected by 2025. The premise for determining where to site the FM workgroup is based on "being where the work is," for operating efficiencies and to minimize travel times to field worksites. The study addresses two questions:

1. What future service growth does the Six-Year Plan anticipate for each sub-area and what demand would the increase in service and ridership have for additional facilities?

2. Would the amount of growth in transit service and ridership by 2025 in any particular sub-area significantly change the locus of operating efficiencies for FM?

Transit's Facilities Maintenance workgroup maintains over 1,700 separate transit facilities throughout the county. The organizational history and field maintenance functions are documented in the "North Lake Union Facilities Maintenance Relocation Study," July 2005. The current (2005) extent of service locations within the county are depicted in Figure 1.

The Sub-Areas

Transit plans its bus service by dividing the county into three sub-areas. Figure 1 shows the rough boundaries of the west, south and east planning areas.

The highest ridership in the transit system, presently over 75%, is in the west. Not surprisingly, it corresponds with the most densely populated cities and communities in this sub-area. Sixty percent (60%) of all transit facilities are located in the west sub-area. Sixty-three percent (63%) of bus shelters are located predominantly in the greater Seattle area. The highest extent of maintenance on passenger facilities occurs in the west because of the ridership, dense central business districts, and frequent bus service.

Population growth is increasing rapidly in south King County. While not matching the type of density found in the west, the Six-Year Plan earmarks the south sub-area for improved service levels between urban centers. Presently, the south has 20% of all transit facilities; about 19% of that total is bus shelters.

The east has its suburban cities located along the western part of the sub-area and becomes more rural towards the eastern part of the county. The highest transit use is along the main travel corridors (SR-520, I-90, I-405, etc.) and the service is commuter-oriented. While local center-to-center bus service has continued to grow, corresponding transit facilities are Park-and-Ride lots and transit centers rather than bus shelters. This accounts for the east's lower percentage of bus shelters at 18%. Of the total number of transit facilities, the east sub-area has close to 20%.

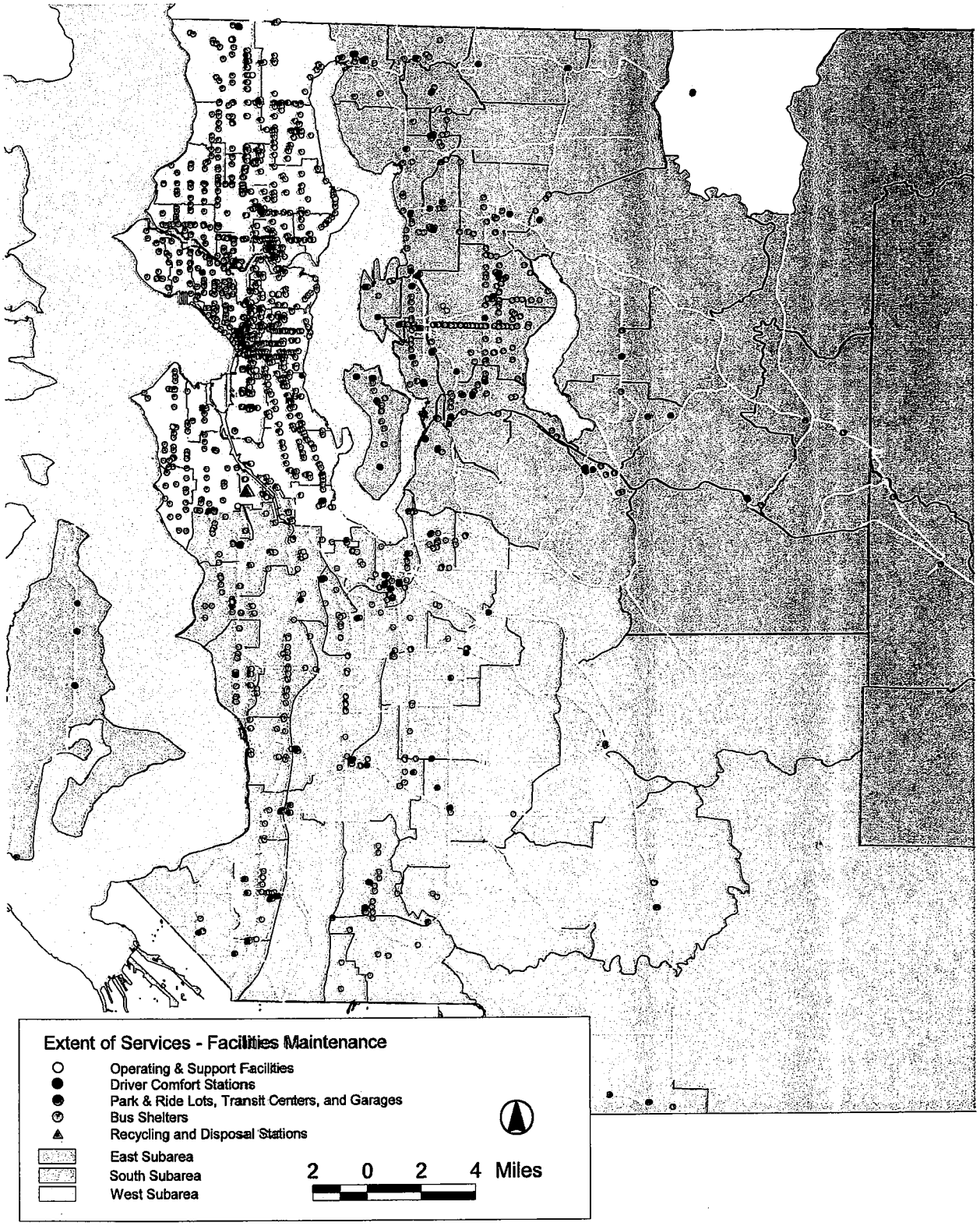

Fig. 1. Extent of Service
Transit properties serviced by Facilities Maintenance crews

Assumptions

The level of analysis for this study uses a cumulative growth in the number of transit facilities, but excludes the differentials on the sizes and functions of these facilities. Thereby, the analysis does not apply weights nor account for different maintenance responsibilities and frequencies. The focus is on the present and future concentration and distribution of facilities in each sub-area, which in turn, become additional worksites that FM crews must travel to perform work.

The general assumptions that frame the analysis are stated below:

- Consistency with Transit's Six-Year Plan for 2002-2007 strategies, objectives and service concepts.
- Service projections follow the King County Council plan for allocating new service hours: 20% to the west, and 40% each to the south and east sub-areas.
- A general service growth indicator of 1% increase per year, county-wide. This rate does not presume new transit initiatives.
- Projected service growth does not include service by Sound Transit.
- Transit facilities do not include facilities owned by other transit agencies.
- Future transit-owned facilities factor in assumptions for future facilities owned by Sound Transit.
- Eventual conversion of the Downtown Seattle Transit Tunnel (DSTT) completely to rail will compel a significant change in bus service in and through downtown Seattle. The magnitude of this change is unknown at this time.

Methodology

Data on the number and types of transit facilities was provided by Metro Transit. Service projections and the associated types and general distribution of new facilities were examined with Transit staff who represented the Facilities Maintenance, Service Planning and Route Facilities sections. Unlike the detailed analysis performed in the main "North Lake Union Facilities Maintenance Relocation Study," the locations of future facility sites are not known. Thus, the analysis depends on comparing the current distribution of facilities to the projected distribution of facilities by sub-area over 20 years. Figure 2 shows the current number of transit facilities located in each sub-area and the general sub-area distribution.

	Subareas			
Facility Type	West	East	South	total
bus bases	4	2	1	7
maintenance facilities	4	0	2	6
support facilities	3	1	1	5
power substations	51	0	0	51
driver comfort stations	16	17	13	46
passenger facilities	19	45	53	117
bus shelters	961	279	281	1,521
subtotals	1,058	344	351	1,753
distribution	60.4%	19.6%	20.0%	

Fig. 2. Current Number of Transit Facilities by Sub-Area, 2005

A service growth projection – excluding Sound Transit service – was applied based on an estimated 1% increase per year. A corresponding estimate of the Transit-owned facilities needed to support the service within 10 and 20 years was determined. Then extending the Six-Year Plan's transit improvement concepts outward to 2025, the types and number of facilities were distributed in the sub-area most likely to meet future transit planning goals. This future distribution of facilities by sub-area was then compared with the current distribution to examine the change and any impact affecting the Field Maintenance relocation.

Service Growth and Facility Growth

As Metro Transit is nearing an update of its 2002-2007 Six-Year Plan, the absence of long-range revenue data and changing ridership profiles allow for only rough estimates for the time period beyond 2008. Service planning estimates expect overall transit service hours to increase by about 20-25% from the current 3.3 million to about 4 million service hours in the next 20 years (2025). Prior to making a similar estimate to the number of transit facilities needed to support the growth, an explanation about capital facilities development is warranted.

An important distinction between service planning and facility planning is that each has different demand indicators: Service planning is based on ridership while facility planning is based on capacity. The two are linked but growth in facilities is not commensurate with growth in service.

Main capacity concepts used to determine new or expanded facilities are described below:

- Additional bus base capacity is needed by 2020 to maintain and operate an expanded bus fleet.
- Bus base and support facility capacity needs to 2020 would be met though fleet re-assignments and modifications of existing facilities.
- Generally, overall needed capacity would be met first through expansion of existing facilities, then, if fiscally defensible, build new facilities. Maximizing the use of existing Transit assets is a priority in the Six-Year Plan capital strategy.
- New park-and-ride lots/garage or transit centers are likely to be located in the south and east sub-areas, consistent with the service profiles and land is available for such uses.
- There is consistently more unmet demand for bus shelters from the west sub-area than from the south or east.

Figure 3 shows the estimated transit facility growth in the next 10 and 20 years

Facility Type	2005	Est. 2015 Growth	Est. 2025 Growth	Subtotal 2015-25	Est. Totals by 2025
bus bases	7	0	1	1	8
maintenance facilities	6	0	0	0	6
support facilities	5	0	1	1	6
power substations	51	0	0	0	51
driver comfort stations	46	6	6	12	58
passenger facilities	117	4	4	8	125
bus shelters	1,521	87	94	181	1,702
					1,956

Fig. 3. Estimated Transit Facility Growth to 10-20 years

Overall, facility growth over the next 20 years will increase about 10% county-wide. This rate of growth reflects only Metro Transit's part of the larger public transit picture that foresees growth in service and facilities from Sound Transit. For instance, Sound Transit's own maintenance facility located in Seattle, light rail startup in the west sub-area subsuming ownership of the bus tunnel and stations, expanded commuter rail from the west through the south, and expanded express bus service in the east. Including the potential role of Sound Transit in King County, the basis of Metro Transit's 20-year facility projections are:

- Bus shelters have the highest growth, increasing the total to 1,702, or about 11% more. Most of the shelters would be located in the greater Seattle area due to demand.
- Second highest in growth are the driver comfort stations (restrooms) which correspond to new bus routes. The estimated total by 2025 is 58, or about 21% more.
- Eight new passenger facilities (lots, garages, transit centers) could be added to the south and east sub-areas to improve commuter services. *Note: Some passenger facilities, while owned by Metro Transit, may be jointly used by Sound Transit, Community Transit or Pierce Transit agencies.*
- An eighth bus base, in the capacity planning horizon for 2020, is expected to be located in south King County.
- One support facility, a new permanent Transit Police Headquarter, is anticipated between 2010-2015. The police are in temporary offices and a new facility would support its heightened role in transit security.
- There are no plans to expand the trolley bus system which operates exclusively in Seattle. Therefore no growth in power substations is expected.
- No new maintenance facilities are planned.

Facility Distribution Changes by Sub-area by 2025

To compare the percent change in the distribution of facilities from 2005 to 2025, the growth in new facilities were placed in the sub-areas as guided by the Six-Year Plan and capacity planning. Figure 4 shows the current and future new facility locations by sub-area.

	West			East			South		
Facility Type	2005	Est. 20 yr Growth	2025 Total	2005	Est. 20 yr Growth	2025 Total	2005	Est. 20 yr Growth	2025 Total
bus bases	4	0	4	2	0	2	1	1	2
maintenance facilities	4	0	4	0	0	0	2	0	2
support facilities	3	1	4	1	0	1	1	0	1
power substations	51	0	51	0	0	0	0	0	0
driver comfort stations	16	6	22	17	2	19	13	4	17
passenger facilities	19	0	19	45	2	47	53	6	59
bus shelters	961	103	1,064	279	38	317	281	40	321
subtotals	1,058		1,168	344		386	351		402
distribution	60.4%		59.7%	19.6%		19.7%	20.0%		20.6%
% change in subarea distribution	-0.6%			0.1%			0.5%		

Fig. 4. Transit Facilities Growth by Sub-Area, 2005 and 2025

West Sub-area:

- No large facility additions anticipated except for bus shelters, mostly for the greater Seattle area.
- Much of the bus shelter increase is due to the amount of unmet demand and changes in ridership on existing routes, and not related to new service.
- No new P&R lots are expected due to the lack of available land and land use constraints in the urban communities.

East Sub-area:

- Growth in Park-and-Ride lots will support the commuter-oriented service in this subarea.
- Additional bus shelters, unlike the west (Seattle) sub-area service profile, are related to new service and is consistent with the plan for more Eastside center-to-center service.

South Sub-area:

- Capacity planning anticipates a new bus base to support service growth in south King County.
- Service in south King County is anticipated to have a mix of new local, center-to-center bus routes and commuter-oriented passenger facilities.

Conclusions

Given the future distribution of transit facilities by 2025, which sub-area would pose the optimal location for a new Facilities Maintenance worksite? The answer would remain, *"In the west sub-area."*

The percent change is minimal, with the combined east and south sub-areas *gaining just over half of one percent* while the west loses 0.6%. In spite of the projected service growth, transit facilities are expected to grow based on different indicators of capacity, reflect the different service profiles (urban/suburban, local/commuter, employment centers, etc.) and the land uses that will evolve in each sub-area.

Even with a modest growth (over the next 20 years) in the number of facilities in the west sub-area, western King County will continue to have the majority – close to 60% -- of the projected total facilities. The east and south sub-areas are projected to have insignificant changes, both remaining at about 20% by 2025.