

Appendix C: Assumptions and Methodology

Costs METHODOLOGY

Smart Moves 3.0 plan Elements

The *Smart Moves 3.0* plan recommendations include 44 new or modified routes and 33 existing routes that would remain essentially unchanged. Costs of the existing routes is known, but costs of the new or modified routes needed to be estimated. While precise cost estimation is not necessary or even practical for this level of planning effort, it is important to develop cost estimates that are as accurate as possible and are consistent with existing transit service costs in the region. To achieve this, the KCATA's fully allocated costing model was used. This costing model accounts for all of KCATA's direct and indirect costs associated with providing transit service and allocates those costs based on service miles and hours for each route operated by the KCATA. Through the course of developing route-level recommendations for this planning effort, estimates of service miles and hours for each new or modified route were produced. To estimate recommendation costs, the KCATA's direct and indirect cost rates were applied to the miles and hours estimates for each route.

Non-ADA Paratransit

Non-ADA paratransit service is a component of the package of mobility services that will make up a comprehensive regional public transportation network. As such, an estimate of cost for non-ADA paratransit service associated with the implementation of the service recommendations was developed. The methodology for developing this estimate of cost involved extrapolating the KCATA's current investment in non-ADA transit service across its current service area to the regional service area described in the *Smart Moves 3.0* plan. This extrapolation was accomplished by determining the percentage of the KCATA's current budget that is devoted to non-ADA paratransit service (0.6%) and applying that to the estimated cost of the *Smart Moves 3.0* plan to arrive at an estimate of regional non-ADA service.

ADA Paratransit

While non-ADA paratransit service is not specifically addressed in the *Smart Moves 3.0* plan, expansion of ADA paratransit services associated with the transit service expansion described in the plan is required and, therefore, must be accounted for in the estimate of *Smart Moves 3.0* plan costs. Estimating the cost of ADA paratransit service was accomplished in the same manner as described above for non-ADA paratransit service. In this case the percentage of KCATA's current budget devoted to ADA paratransit service is 12.5%.

Community-based Service

Certain existing community-based transit services, specifically in Independence, Lee's Summit, Raytown, Gladstone, North Kansas City and Olathe are not addressed in the *Smart Moves 3.0* plan. However, the cost of these services has been singled out and included in the estimate of total regional public transit investment needed to achieve the regional transit vision described in the *Smart Moves 3.0* plan. For the purposes of this effort, the amount of investment in these services is assumed to remain constant, aside from inflationary increase, over the course of the *Smart Moves 3.0* planning horizon.

Mobility Hubs

In the course of developing the *SmartMoves 3.0 Regional Transit Plan Update* four types of “mobility hubs” were defined. Mobility hubs are facilities designed to support the interaction and connectivity between transit and other transportation modes. The four mobility hub types, which are described earlier in this report, are;

- Destination
- Junction
- Gateway
- Local

For purposes of developing more refined estimates of cost, the following sub-types were identified for each of the mobility hub types:

- Destination
 - Central Business District (CBD)
 - Urban Core
 - Urban Edge
 - Suburban
- Junction
 - Urban Core
 - Urban Edge
 - Suburban
- Destination
 - Urban Edge
 - Suburban with Park & Ride
 - Suburban without Park & Ride
- Local
 - With Transit Connection
 - Without Transit Connection

Mobility Hub Major Cost Elements

The approach taken to estimate cost for each mobility hub type involved the identification of major cost elements. The cost elements identified and used in this effort include the following:

- Planning, Design and Supervision
- Land Acquisition
- Site Improvements and Utilities
- Construction
- Amenities

Mobility Hub Cost Estimation Methodology

An estimation of cost for each mobility hub type and sub-type was accomplished by assigning representative costs to each of the major cost elements identified above. These representative costs were derived from the actual costs of developing similar facilities within the Kansas City region and in

peer communities. With the assignment of representative costs to each major cost element a representative cost for each mobility hub sub-type was derived.

COST ALLOCATION

Allocation of Cost by Phase

Development of the *Smart Moves 3.0* plan is assumed to occur in three phases:

- Phase I plan elements would be implemented in years 0-5.
- Phase II plan elements would be implemented during years 5-10.
- Phase III plan elements would be implemented years 10-15, or beyond depending funding availability. It should be noted that modeling to estimate change in job access was based on a 20 year horizon.

Through public input into the planning process and consultation with MARC and KCATA, each of the individual plan elements was assigned to one of the three phases. The estimated investment required for each phase was calculated by summing the estimated cost of each plan element included in each project phase.

Allocation of Cost by Jurisdiction

It is important to understand the cost implications of implementing the *Smart Moves 3.0* plan recommendations for regional governmental jurisdictions. For this effort, it was determined that cost would be allocated to Kansas City, Missouri, and non-KCMO portions of Cass, Clay, Jackson and Platte Counties in Missouri, as well as Johnson and Wyandotte Counties in Kansas. Allocation of cost between these jurisdictions was accomplished by determining the percentage of service miles operated within each jurisdiction for each non-express service plan element and assigning cost based on this percentage. Express service cost allocation was based on a 50/50 split of cost between the origin and destination jurisdictions.

COST ESTIMATES

Methodology and Assumptions for Rolling Stock Cost Estimation by Phase

Cost Estimation

Smart Moves 3.0 recommendations include the need for an expansion of the current bus fleet from 322 vehicles to 418 during the 20-year plan horizon. Estimating the cost of this expansion requires assumptions about vehicle unit costs, vehicle depreciation rates and vehicle acquisition timing. Following is a description of these assumptions.

Vehicle Unit Costs: The following four vehicle types make up the current transit fleet:

- Bus Rapid Transit (BRT) buses
- Forty-foot transit coaches (Large Buses)
- Thirty-foot transit coaches (Small Buses)
- Mini-buses of varying length with seating capacities of 18 or less

In addition, *Smart Moves 3.0* assumes the addition of a fifth vehicle type – Over-the-road (OTR) coaches for longer commuter routes. The assumed current unit cost for each of these vehicles is;

- OTR - \$550,000

- BRT - \$525,000
- Large - \$450,000
- Small - \$385,000
- Mini - \$75,000

Vehicle Depreciation: Each of the described vehicles is assumed to have a useful life after which the vehicle is fully depreciated and requires placement is required. The following average depreciation periods have been assumed for each vehicle type:

- OTR - 12 Years
- BRT- 12 Years
- Large - 12 Years
- Small - 10 Years
- Mini - 6 Years

Vehicle Acquisition Timing: *Smart Moves 3.0* assumes a current fleet of 322 total vehicles made up of the following vehicle types:

- BRT- 30
- Large - 144
- Small - 103
- Mini - 45
- Total - 322

As the plan elements are implemented by phase the number of vehicles required will change. Following is a breakdown by phase of vehicle additions/(deletions) required for plan implementation.

PHASE 1

	Addition/Deletions	Total
• OTR	4	4
• BRT	8	38
• Large	(8)	136
• Small	0	103
• <u>Mini</u>	<u>10</u>	<u>55</u>
		336

PHASE 2

	Addition/Deletions	Total
• OTR	16	20
• BRT	2	40
• Large	(18)	118
• Small	210	5
• <u>Mini</u>	<u>35</u>	<u>90</u>
Total		373

PHASE 3

	Addition/Deletions	Total
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• OTR	20	40
• BRT	17	57
• Large	(18)	100
• Small	5	110
• Mini	21	<u>111</u>
		418

Determination of rolling stock costs during the duration of the plan was made by unit cost estimates to the number of vehicles required and determining the number of replacement vehicles due to depreciation over the life of the plan. Depreciation periods for Phases 1 and 2 were assumed to be 5 years respectively, and the depreciation period for Phase 3 was assumed to be 10 years. This is reflective of the plan's 20-year horizon.