



## CLARK COUNTY HIGH CAPACITY TRANSIT SYSTEM PLAN

### Evaluation of Wide Range of Potential HCT Modes – Initial Screening

The Clark County High Capacity Transit System Study is a comprehensive study effort that will evaluate and recommend a long-range high capacity transit system to serve the travel needs of Clark County residents. The final system plan will be based on a detailed assessment of HCT modes in the most promising HCT corridors in the county.

In this initial evaluation process, HCT modes and HCT corridors are screened concurrently. The mode evaluation screens a broad list of conceptual modal alternatives to determine their transportation system benefits and financial feasibility for the region. The purpose of this initial screening is to narrow the range of potential HCT modes to those that have the most promise to meet the long-range travel needs of Clark County residents.

### Screening Criteria

The differences between alternatives/modes are sometimes minor, and reflect continuums of options rather than discrete, uniformly grouped characteristics. In general, this initial screening will be based on fatal flaws or other characteristics that would limit the ability of the alternative to address the study's purpose and goals/objectives statements.

For this initial screening, the following evaluation criteria are applied:

- *Satisfies Study Purpose and Goals* – Consideration of the effectiveness of the mode in meeting the study purpose and the goals as identified previously.
- *Proven Technology* – Assessment of whether the technology has been successfully implemented and operational anywhere in the U.S.
- *Economic Development* – A qualitative assessment of the potential for economic development along the corridor and potential for TOD.
- *Capital Costs* – Range of capital costs for constructed comparable systems. [Source: National Transit Database, PB, and other Agencies]. Based on range of capital costs for constructed systems, costs have been grouped in general low-medium-high categories.
- *Land Use Compatibility* – A qualitative assessment of integration of land use with transportation as measured by existing densities that can support the mode.

## Summary of Findings

A total of nine modes were evaluated in the initial screening process:

Commuter rail, bus rapid transit (BRT – on exclusive lanes), BRT lite (mixed use), heavy rail, light rail, monorail, personal rapid transit (PRT), streetcar and water (river) transit.

The following summarizes the significant issues (fatal flaws) for each mode, as evidenced in screening matrix. A mode that fails in a significant way to meet the goals and purposes of the study (as identified elsewhere) is said to have a fatal flaw. An understanding of the fatal flaws will lead to the narrowing down of modes that are most viable for the HCT study.

- Heavy rail – high capital costs severely limits financial feasibility of this mode (local match costs are prohibitive). Does not satisfy project goals with respect to costs thereby making this issue a fatal flaw in the mode analysis. This mode also performs poorly in terms of land use compatibility because the low densities in Clark County are not conducive to heavy rail.
- Monorail – high capital costs severely limits financial feasibility of this mode (proprietary specialized technology, prohibitive local match). Does not satisfy project goals with respect to costs thereby making this issue a fatal flaw in the mode analysis. This mode also performs poorly in terms of land use compatibility because the low densities in Clark County are not conducive to monorail. This mode is partially successful in terms of proven technology and economic development.
- Personal Rapid Transit – this mode is not high capacity and does not address the issue of congestion mitigation as identified in the study purpose and goals statement thereby making these issues fatal flaws in the mode analysis. This mode also performs poorly in terms of proven technology (very limited applications in the US), economic development (low potential for job growth, TOD) and land use compatibility (mode not feasible for land use integration).
- Water (River) Transit – this mode does not address the issue of connectivity as identified in the study purpose and goals statement thereby making this issue a fatal flaw in the mode analysis. This mode also performs poorly against economic development (no potential for TOD) and land use compatibility (no land use integration); low potential for FTA funding since this mode does not qualify as a fixed guideway transit.

The remaining modes do not possess any fatal flaws but have other obvious strengths/weaknesses that are discussed below:

- Bus Rapid Transit (exclusive lane) – this mode performs well against most screening criteria and can be implemented within reasonable capital costs. BRT gets a medium rating in terms of proven technology because there are not many BRT systems that are operating in the US. It has medium potential for economic development when compared to heavy rail, light rail and streetcar.

- Streetcar – this mode performs well against most screening criteria. This mode gets a medium ranking in the purpose and goals criteria since it partially address the issue of congestion as it has to operate mostly in mixed traffic. Streetcar gets a medium rating in the land use compatibility criterion because the low densities in Clark County are moderately supportive of this mode.
- Light Rail – this mode performs well against most screening criteria. Light rail gets a medium rating in the capital cost criterion (capital cost in the \$40Mil - \$65Mil range). In the economic development criterion, light rail gets a high rating considering an arterial corridor (could be medium rating when considering a freeway corridor). Light rail gets a medium rating in the land use compatibility criterion because the low densities in Clark County are moderately supportive of this mode.
- Commuter Rail – this mode performs well against most screening criteria. Commuter rail gets medium ratings in the economic development (moderate potential compared to heavy rail and streetcar), capital cost (higher costs compared to BRT, BRT lite) and land use compatibility (existing Clark County densities and land uses only moderately supportive of mode). Capital costs for a commuter rail has to take into consideration right-of-way acquisition costs (where applicable), significant freight access fees and cost of upgrading freight tracks to commuter rail standards.
- BRT Lite (mixed use) – this mode performs well against most screening criteria. The weakness is in the economic development criterion which gets a low rating because this mode operates mostly in mixed traffic and there is limited scope for TOD around regular bus stops. It maybe mentioned that BRT lite has the potential for incremental improvement.

### **Rating Methodology**

For each of the evaluation criteria, levels of “ratings” were developed as follows:

- Most adverse impacts or least appropriate
- ◐ Moderate impacts or appropriateness
- Minimal adverse impacts or most appropriate

The ratings defined for each criterion are listed below.

### **Satisfies Purpose and Goals Statement**

- Fails in a significant way to meet one or more study purpose/goals
- ◐ Partially addresses one or more study purpose/goals
- Meets study purpose/goals in a broad sense

### **Proven Technology**

- Very limited implementation within the U.S.
- Moderate level of implementation within in the U.S. or not enough examples to demonstrate
- Several cases of implementation within the U.S.

### **Economic Development**

- Low potential for economic development, TOD
- Moderate potential for economic development, TOD
- High potential for economic development, TOD

### **Typical Capital Costs (2007 \$)**

- Greater than \$75 million/mile
- \$25 - \$75 million/mile
- Less than \$25 million/mile

### **Land Use Compatibility**

- Mode not compatible with existing densities and surrounding land uses
- Mode moderately compatible with existing densities and surrounding land uses
- Mode compatible with existing densities and surrounding land uses

### **Recommendations**

This technical evaluation was presented to the HCT Task Force on March 19, 2007, HCT Steering Committee on April 5, 2007, Regional Transportation Advisory Committee (RTAC) on April 20, 2007, and to the RTC Board of Directors on May 1, 2007.

The final recommendation is that the following modes be carried forward for further consideration in the study process:

- Bus Rapid Transit (BRT)
- Streetcar
- Light Rail
- Commuter Rail
- BRT Lite

## Initial Screening Of Modes - Matrix

Evaluation Category:	Satisfies Purpose and Goals	Proven Technology	Economic Development	Cost	Land Use Compatibility
Criteria:	Addresses the purpose and need and major goals of the study	Existing Applications	Spur business growth and job creation along corridor	Capital Cost	Integration of Land Use and Transportation
Measure:	Fails in a significant way to meet one or more study purpose/goals	Successful Operation in U.S.	Increase potential for economic development	Average Cost per Mile	Typical Land Uses that Support Mode Compared to Existing Densities in Clark Co.
Bus Rapid Transit (BRT) Exclusive Lanes	●	◐	◐	●	●
Streetcar	◐	●	●	●	◐
Light Rail	●	●	●	◐	◐
Commuter Rail	●	●	◐	◐	◐
BRT - Lite	◐	●	○	●	●
Heavy Rail (Subway)	○	●	●	○	○
Monorail	○	◐	◐	○	○
Personal Rapid Transit	○	○	○	◐	○
Water (River) Transit (Passenger Only)	○	◐	○	●	○

○ = Low    ◐ = Medium    ● = High