ESCONDIDO RAPID BUS
TRANSIT PRIORITY CONCEPT STUDY

Draft Final Report
Executive Summary

March 13, 2006
E.0 EXECUTIVE SUMMARY

The Escondido Rapid Bus Transit Priority Concept Study addresses traffic and transit operations issues along the Route 350 alignment, an existing bus route serving the City of Escondido from the Escondido Transit Center to Westfield Shoppingtown North County. High ridership at peak times during the day and traffic conditions along the downtown corridor are the major causes of delay experienced by Route 350 riders.

The Study defines the first “rapid bus” service for North San Diego County which will provide an example for both operators and patrons of what can be accomplished through enhanced transit amenities, service branding, operational enhancements, and transit priority measures. The Study represents a cooperative effort between the City of Escondido, San Diego Association of Governments (SANDAG), and North County Transit District (NCTD) which brought together traffic engineers, transit service planners, regional planners, and public works staff in a Project Working Group to develop a solid consensus on a series of recommendations for the improvement of the Route 350 corridor.

The regional transportation plan, MOBILITY 2030, focuses on improvements to transit operations and performance such as the priority measures identified in this Study. These measures are a way to make transit more competitive with the automobile for many of our trips and therefore open new markets to public transit. Route 350 was selected as the prototype for improvements through a screening process by NCTD, with the intent to apply these improvements to additional corridors in the future.

KEY FINDINGS

- This study identifies a number of key transit priority measures needed such as signal priority for late buses and queue jumper transit lanes at congested intersections.
- Overall, these measures result in an improvement of travel time for Route 350 riders of 16 percent.
- Impacts to traffic caused by these priority treatments are small and can be addressed when these treatments are implemented.
- An additional community benefit is the replacement of existing traffic signals in the downtown business corridor to provide better signal coordination for drivers.
- Improvements to Route 350 stops include an enhanced look and feel, benches, shelters, signage, schedule information, and real-time information on the next arriving bus (at key stops).
- Operational improvements to Route 350 are proposed, including the consolidation of bus stops along Escondido Avenue.

CURRENT ISSUES

The Study effort identified and confirmed a series of issues that either cause delay or operational problems for the current Route 350 service. These issues represent the combined...
input of City traffic engineers, transit operators, transit patrons, and community members, and include:

- Bunching of buses due to traffic congestion and delays (particularly on the Del Lago Boulevard approach to the southbound I-15 on-ramp).
- Heavy boardings near the schools along the southern end of Route 350 (especially at San Pasqual High School).
- Traffic congestion at several locations due to changes in the roadway cross-section, heavy traffic volumes, and signal delays.
- Dispersed boarding activity along South Escondido Boulevard requiring several stops along that stretch of the route.
- General lack of bus stop amenities at many stops (noted by transit patrons) such as schedule and status information, benches, or shelters, etc.

OBJECTIVES

The Project Working Group focused on providing a BreezeRapid service that would:

- Reduce transit travel times and increase schedule reliability by reducing the impact of traffic delays on buses with no significant impact to non-transit vehicle traffic.
- Provide an enhanced transit service experience and perception for riders through:
  - More reliable service connections with MTS Route 20, Escondido Transit Center routes, and the future I-15 Bus Rapid Transit and SPRINTER services.
  - Enhanced stop amenities where possible to provide shelter, benches, and lighting.
  - Special branding to distinguish the BreezeRapid from existing local Breeze bus services.
  - Improved information at stops in terms of signage, schedule information, and real-time information on bus arrivals.
- Reduce the impact to transit operations in terms of scheduling and costs by reducing the variability caused by delays.

PROPOSED IMPROVEMENTS

The Study reviewed and suggested various improvements to resolve the current issues and achieve the objectives of the BreezeRapid service. These improvements can be classified in three categories:
• **Transit Priority Measures** - These include physical and signal based improvements to the roadway and the traffic signal system to aid in reducing overall transit travel times. Some examples include:
  
  o **Transit Signal Priority (TSP)** – A signal system based improvement where intersection signal timing/phasing is adjusted to allow buses running behind schedule to receive slight extension of a green light to avoid hitting a red light with the associated delay. In certain circumstances this also allows for shortening of red lights that a bus may be waiting at to reduce signal delay.
  
  o **Physical Improvements** – Queue jumper lanes are proposed at key intersections including Valley Parkway and Centre City Parkway to provide the bus with a dedicated lane and signal ahead of traffic at the intersection. Other roadway improvements include special signal phases or transit signal priority.
  
  o **Special Transit Access/Other Improvement** – These types of improvements include special access for buses at transit centers, and other improvements such as protected left turn lanes for both buses and other vehicles.
  
• **Transit Operations/Service Adjustments** – These include adjustments to schedules once priority measures are in place or methods of operations that impact or enhance bus service.

• **Stop/Station Improvements** – BreezeRapid stations will have a particular set of amenities such as benches, shelters, enhanced customer information, and special branding at stops and stations. Several preliminary design concepts were developed for and are presented as part of the Study report. This category also includes adjustments to stop locations, stop consolidation, and methods for speeding boarding of buses.

The proposed transit priority measures are summarized in Figure E-1. Figures E-2 and E-3 display the proposed stop and station improvements for the north and south portions of the study area respectively.
Special Access to Future Del Lago BRT Station

Separate NB & SB Queue Jumps at Las Palmas Ave./Peet Ln.

Protected Left-Turn Phases at Valley Pkwy. & 2nd.

WB Queue Jump at Valley Pkwy./Centre City Pkwy.

Intersection Improvements and/or NB Left-Turn Queue Jump

Special Access to Future Del Lago BRT Station

Route 350 Re-aligned Northbound to Beethoven Dr. when BRT Station Opens as Southern Terminus of Route.

Symbol Key:
- Signal Coordination Update
- Signal Priority
- Queue Jumper (arrow indicates direction)
- Special Access or Physical Improvement

Figure E-1
Summary of Proposed Transit Priority Improvements
Figure E-2

Escondido Rapid Bus
Transit Priority Concept Study

Recommended Bus Stop Improvements
North Study Area

Stop 8
Combine with opening of Del Lago BRT Station, re-routing of 810 Express Service

Stop 9
Shelter, DMS

Stop 10
Shelter

Stop 11
Shelter

Stop 12
Consolidate

Stop 13
Trash can

Stop 14
Bench

Stop 15
Consolidate

Stop 16
Shelter

Stop 17
New sign, relocate trash cans

Stop 18
DMS, signage

Stop 19
Shelter

Stop 20
Consolidate

Stop 21
Trash can

Stop 22
Bench, DMS

Stop 23
Consolidate

Stop 24
Shelter

Stop 25
Shelter

Stop 26
Shelter, DMS

Existing Route 350 Bus Stop
Bus Stop Recommended for Consolidation
(Text notes added bus stop features or changes)
Escondido Rapid Bus
Transit Priority Concept Study

Figure E-3
Recommended Bus Stop Improvements
South Study Area

- Stop 2
  Consolidate w/ opening of Del Lago BRT Station

- Stop 2A
  New stop w/ opening Del Lago BRT Station

- Stop 1
  Consolidate

- Stop 27
  Shelter

- Stop 2B
  New stop would serve mall via Northbound Route 350

- Stop 28
  Add trash can

- Stop 29
  Shelter, DMS

- Stop 30
  Two large shelters, DMS

- Stop 29
  Consolidate

- Stop 31
  Consolidate

- Stop 3
  Consolidate

- Stop 4
  Two large shelters, DMS

- Stop 5
  Shelter, DMS

- Stop 6
  Add trash can

- Stop 7
  Shelter

Route 350 re-aligned Northbound to Beethoven Dr. when BRT Station opens as Southern terminus of route

Existing Route 350 Bus Stop
Bus Stop Recommended for Consolidation
Future Bus Stop
(Text notes added bus stop features or changes)
BENEFITS AND POTENTIAL IMPACTS

The Study analyzed the potential benefits and impacts associated with implementation of the proposed transit priority measures. In general, the Study found:

- Due to the signal related delay experienced by buses along Route 350, the implementation of transit signal priority at signalized intersections along the corridor would visibly reduce the delay experienced by buses.
- Implementation of the proposed transit priority measures has the potential to reduce one-way transit travel times along Route 350 by 16%.
- The review of potential traffic impacts under average and worst-case conditions indicates that impacts to other vehicle traffic would be small, and can be managed or minimized with proper design and adjustments to the range of settings available with transit signal priority.

The development, design, and implementation of transit priority measures is an opportunity for City traffic engineers and transit operators to work together to find an ideal balance that provides benefits to transit service without significant impacts to other traffic. Unlike a typical development or construction project, the operation of transit priority measures is an iterative process that allows for refinement and adjustment to changing traffic patterns and conditions over time.

PHASING AND PRELIMINARY COST ESTIMATES

Figure E-4 displays the proposed phasing of the Rapid Bus improvements into:

- **Initial Phase (Years 1-2)** – These improvements, such as signal priority, provide visible near-term benefits without significant implementation concerns.
- **Mid-Term Phase (Years 3-5)** – These improvements provide additional benefits, but require a more detailed review and engineering process, or they are related to the opening of the Del Lago Bus Rapid Transit Station and the start of the I-15 Bus Rapid Transit service.
- **Future Phase (Years 5+)** – These improvements can provide benefits, but may best be implemented in coordination with other transportation improvement projects such as roadway widenings that benefit all traffic.

Table E.1 provides a high level summary of the costs by category and phase.

Some of the proposed Future Phase improvements may not be feasible outside of a larger roadway improvement effort. Most of the benefits to transit are gained in the Initial and Mid-Term Phases. Implementation of the Initial Phase and Mid-Term Phase only would lower the total estimated costs to $2.42M, including $1.90M for transit priority and operations measures and $522K for stop/station improvements.
<table>
<thead>
<tr>
<th>INITIAL PHASE (YRS 1-2)</th>
<th>MID-TERM PHASE (YRS 3-5)</th>
<th>FUTURE PHASE (YRS 5+)</th>
</tr>
</thead>
</table>
| **Vehicle Priority Equipment** | **Queue** | More Physical Transit Priority Measures at:  
  • Bear Valley Pkwy./Sunset Dr.  
  • SB Bear Valley Pkwy./Las Palmas Ave.  
  • Transit Lane along WB Valley Pkwy to Quince St.  
  Coordinate with Future Roadway Improvements |
| **Signal Coordination & Updates** | **Jumps at:** |  
  • WB Valley Pkwy./Centre City Pkwy.  
  • NB Bear Valley Pkwy./Las Palmas Ave. |
| **Signal TSP Equipment & Configuration** | **New Stops at Del Lago BRT Station and Westfield’s NB:** |  
  • Bear Valley Pkwy./Sunset Dr.  
  • SB Bear Valley Pkwy./Las Palmas Ave.  
  • Transit Lane along WB Valley Pkwy to Quince St.  
  Coordinate with Future Roadway Improvements |
| **Protected Left-Turn Phases Improvements** | **Remaining Stop Improvements** |  
  | **Key Stop Improvements & Branding** | **Special Access at Del Lago BRT Station:** |  

**Escondido Rapid Bus Transit Priority Concept Study**

Figure E-4
Summary of Proposed Project Phasing
Table E.1 - Estimated Preliminary Costs by Phase

<table>
<thead>
<tr>
<th>Phase</th>
<th>Improvements Types</th>
<th>Total Base</th>
<th>Design (15%)*</th>
<th>Contingency (30%)</th>
<th>Totals</th>
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<tr>
<td>Initial Phase</td>
<td>Transit Priority/Transit Ops.</td>
<td>$690,000</td>
<td>$30,000</td>
<td>$210,000</td>
<td>$930,000</td>
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<td></td>
<td>Stations/Stops **</td>
<td>$300,000</td>
<td>$45,000</td>
<td>$90,000</td>
<td>$435,000</td>
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<td></td>
<td></td>
<td></td>
<td>Phase Subtotal $1,365,000</td>
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<td>Mid-Term Phase</td>
<td>Transit Priority/Transit Ops.</td>
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<td>$100,000</td>
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<td>$970,000</td>
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<tr>
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<td>Stations/Stops</td>
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<td>Future Phase</td>
<td>Transit Priority/Transit Ops.</td>
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<td>$2,390,000</td>
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<td></td>
<td>Stations/Stops</td>
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<td>N/A</td>
<td>N/A</td>
<td>$-</td>
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<td></td>
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<td>Phase Subtotal $2,390,000</td>
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<td></td>
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<td></td>
<td>Total Cost Estimate $4,812,000</td>
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</table>

Note: * The 15% design cost factor is only applied to cost items requiring design, and is not a flat % applied to the total base cost.

** Station/Stops includes bus branding of $10,000 each for 10 buses during the initial deployment phase.

SUMMARY

The Escondido Rapid Bus Transit Priority Concept Study has identified a series of viable improvements that would substantially enhance transit service in the corridor and provide an excellent model for wider deployment of Rapid Bus services throughout North County. The fact that these improvements were developed as a cooperative effort between the City of Escondido, SANDAG, and NCTD means that there is a common understanding of what these improvements would entail in terms of actual implementation and operation.

The opportunities for early public input provided through the Study outreach efforts have allowed for the incorporation of issues and concepts developed by transit patrons and the community, and this input will provide a solid foundation for moving forward with the Initial Phase. The BreezeRapid concepts defined in this Study represents an excellent opportunity to quickly move forward with design and implementation to provide clear near-term benefits to transit service in the Escondido area.

Next steps include additional traffic signal analysis in the Downtown Escondido area, engineering and design for the proposed treatments, and implementation.