North University Town Center/Sorrento Valley Transit Study Executive Summary

Introduction

The purpose of this study is to evaluate transportation options for the north Interstate 805 (I-805) corridor. Currently, there is a number of major freeway infrastructure projects planned or being implemented along the north I-805 corridor that will provide routing options for planned Bus Rapid Transit (BRT) services. This study developed recommendations for alignment options for the planned BRT services using these freeway improvements, strategies for overcoming first mile/last mile impediments in order to effectively serve the widely dispersed destinations in North University Town Center (UTC) and Sorrento Valley ("project area"), and identified facility needs.

The San Diego Association of Governments (SANDAG) contracted with Kimley-Horn and Associates, Inc., (KHA) to support this study. In addition to KHA, the project team included staff from SANDAG's Transit Planning, Active Transportation Planning, and Transportation Demand Management Divisions along with staff from Caltrans, Metropolitan Transit System, and the City of San Diego. The project team meeting dates were as follows:

- Kick-Off Meeting – June 26, 2013
- Meeting #1 – July 16, 2013
- Charrette Meeting #1 – August 22, 2013
- Charrette Meeting #2 – September 10, 2013
- Charrette Meeting #3 – October 25, 2013

The meeting agenda and notes for every meeting listed above are found in Appendix A.

Task 1: Identification of Planned Transit Services within the North I-805 Corridor

The first task of this project was to create an inventory of existing and planned BRT and local bus services and infrastructure improvements in the project area. The baseline for these maps was SANDAG's 2050 Regional Transportation Plan (RTP). A matrix and a series of maps were developed.

The 2050 RTP includes multiple BRT routes serving the north I-805 corridor and Sorrento Valley project area.

Route #	Description	Decade	Span
470	Escondido to UTC/UCSD via Mira Mesa Boulevard	2018	Peak
680	Otay Mesa to Sorrento Mesa via I-805 Corridor, Otay Ranch/Millenia, National City, Southeastern San Diego, Mid-City, Kearny Mesa	2018	All Day
688	San Ysidro to Sorrento Mesa Express	2018	Peak
689	Millenia/Otay Ranch to UTC/Torrey Pines Express	2018	Peak
870	El Cajon to UTC via Santee, SR 52, I-805	2020	Peak
890	El Cajon to Sorrento Mesa via SR 52, Kearny Mesa	2030	Peak

A series of maps were developed, included in Appendices B1 through B3 of proposed BRT services, existing and proposed local transit services, and proposed freeway improvements.

A memo summarizing the existing and proposed transit and freeway projects planned in the corridor, along with inventories, maps, and matrices is available in Appendix B4. The memo also includes a discussion on which of the Bus Rapid Transit services in the 2050 RTP are also included in the *TransNet* Extension and Ordinance.

Task 2: Development of Alternative BRT Service Strategies

The project team researched and summarized alternative operating strategies and best practices, particularly those that would serve office parks in other regions.

The project team did a literature review and interview of agencies that implemented last mile "best practices." The cities reviewed were the San Francisco Bay Area, Denver, Minneapolis, and Minnesota. Many of the long distance commute patterns found in these cities are similar to San Diego commute patterns. Two types of best practices were analyzed: those that improved the users mobility choices and those that improved the usage of mobility options through outreach.

Afterwards, the project team developed three alternative operating strategies to serve the project area:

1) **Trunk and Feeder:**
   Trunks are efficient and high capacity routes that connect regional nodes. This system creates more schedule efficiency for those travelling longer distances, because the bus is able to stay on a main road without going out of direction. Feeder routes connect those nodes to customer origin and destination points. The service will have stops in destination areas located on the main road, and provide opportunities for transit users to transfer to other services in order to get to their final destination. A local example of this would be the Coaster Trunk line linked to the Coaster Connection feeder services.

2) **Nodal**
   Nodal (also known as Circular or Destination-Based) systems take customers to areas with high densities of development and accessibility. This system type connects users to destinations around the surrounding local area. A local example of this is the *SuperLoop* which connects the University of California, San Diego (UCSD) and UTC areas.

3) **Multi-Modal**
   Multi-Modal (also known as first-mile/last-mile solutions) considers alternative transportation methods and establishes connections amongst all modes. Some examples of these Transportation Demand Management solutions include car-sharing, bike-sharing, employer shuttles, vanpools, carpools, and employee commute benefit programs.

Appendices C1 through C5 are memos detailing the three operating strategies, and how each one impacts station needs, transit priority needs, pedestrian access needs, and capital and operating costs.

Task 3: Evaluation and Selection of Preferred Operating Strategy

The project team discussed and evaluated the proposed operating strategies at three design charrettes, also accounting for input received from stakeholders through outreach. A Transfer Opportunity Matrix and a Transit Infrastructure Utilization Table were developed to evaluate the operating strategies. Given the diverse characteristics within the project area, a combination of the three alternative BRT service strategies was selected for this project.

Throughout the three design charrettes, the alignments and span of service of the BRT routes proposed in the RTP were further refined. To maximize the effectiveness of these routes, the project team also developed Hospital and Sorrento Valley shuttle routes that would act as first mile/ last mile strategies in these difficult to serve areas.

SANDAG solicited input from stakeholders by attending Community Planning Group meetings, including University City, Mira Mesa Town Council, and Torrey Pines. SANDAG staff also met with UCSD Auxiliary Business Services for feedback.

Appendices D1 through D3 includes memos detailing the evaluation results, stakeholder group input, and recommendations including maps with the final proposed alignments.

Task 4: Identify Transit Priority Measure Needs

SANDAG used existing projects and studies to identify transit priority measures currently planned or implemented in the project area, and compared those to congested roadways and signals that were identified in the project area and the recommended final alignments of the BRT routes in order to identify additional areas where transit priority measures should be considered. Types of transit priority measures that were considered are transit signal priority, transit-only lanes, shared lanes, queue jumps, and signal phasing.

Appendices E1 through E5 identify congested roadway segments and intersections, identify potential transit priority measures, and outline the operating and capital costs associated with transit priority measures.

Based on the analysis completed in those appendices, the study recommends considering transit signal priority for the following intersections:

- La Jolla Village Drive and Genesee Avenue
- La Jolla Village Drive and Towne Centre Drive
- La Jolla Village Drive and I-805 SB Off-Ramp
- Nobel Drive and I-805 NB Off-Ramp
- Nobel Drive and I-805 SB On-Ramp

Task 5: Pedestrian Access

The project team also identified pedestrian impediments in the project area per the Safe Routes to Transit program and identified possible solutions in this multi-modal study. The study area has numerous areas of concern that create barriers for pedestrian access to transit. The two biggest

concerns are the grade of the paths of travel to and from transit stops and the lack of continuous sidewalks throughout the project area.

The Safe Routes to Transit Typologies were used to determine area needs, with two station areas within the project area evaluated in depth: 1) Lusk Boulevard at Barnes Canyon Road and 2) Executive Drive at Genesee Avenue.

The project team identified improvements for pedestrian and bicycle access to and from transit areas that could be implemented in the study area, including continuous sidewalks, diagonal-pedestrian cross walks, sheltered pathways, crosswalk stop bar improvements, pedestrian islands, improved lighting at intersections, mid-block crossings, and audio crosswalks. The analysis of pedestrian access and potential improvements are included in Appendices F1 and F2.

Task 6: Preferred Alternative Costs Refinement and Phasing Plan

Service cost estimates were developed for the two shuttle loop services that the project team proposed as part of Task 3. The phasing options that the project team discussed as part of Task 3 also were further refined in order to develop a final implementation and phasing plan recommendation. The analysis for Task 6 is included in Appendices G1 through G3.

Task 7: Public and Stakeholder Outreach

A website for this project has been created at:
http://www.sandag.org/index.asp?classid=13&subclassid=9&projectid=444&fuseaction=projects.detail

Outreach materials have been posted to the SANDAG project website in order to allow stakeholders to review and distribute.

These outreach materials were used at meetings with various community planning groups and other stakeholders:

- UCSD Auxiliary Business Services - 5/2/2013, 10/1/2013
- Torrey Pines Community Planning Board - 5/9/2013, 10/3/2013
- University Community Planning Group - 6/11/2013, 10/8/2013
- Mira Mesa Town Council - 10/7/2013
- Council Pro Tem Sherri S. Lightner - 10/30/2013

Stakeholders were also involved directly in the Project Team. Minutes from each of the project team meetings are included in Appendix A.

Conclusions

All recommendations resulting from this study, including the BRT alignments, proposed shuttle routes, and phasing recommendations, will be considered for inclusion in the preferred network in the next Regional Transportation Plan update.

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Kick-Off Meeting

June 26, 2013 –1:30 to 2:30 pm

SANDAG Office – 401 B Street Suite 1000, Conference Room 10C

Conference # - 619-595-5385

1. **Introductions**
2. **Project Goals and Overview**
   - Review existing / planned transit services and freeway improvements
   - Summarize successful transit services in other suburban offices/business parks
   - Approach to alternative operating strategies
   - Develop list of priority measures for each operating strategy
   - Assess barriers to pedestrian access for each operating strategy
   - Estimate capital and annual operating costs for each operating strategy
   - Evaluate and select preferred operating strategy
3. **Review Field Walk**
   - Nobel DAR / Park and Ride, UCSD Circulation, Carroll Canyon DAR
   - Other Issues and Concerns
4. **Review of Projects (Draft Handout)**
   - Constructed / Complete, Under Construction, Design, Planning, RTP
   - Mid-Coast and SuperLoop
   - Coordination and Integration of Projects in the UTC / Sorrento Mesa Communities
5. **Updates**
   - Community Planning Group
   - Other Coordination
6. **Next Steps/Action Items**

Next Meeting – Tuesday, July 9, 2013 – 1:30 to 2:30 pm

Kick-Off Meeting Notes
June 26, 2013 –1:30 to 2:30 pm
SANDAG Office – 401 B Street Suite 1000, Conference Room 10C

Meeting Start – 1:30 pm

1. Introductions / Check-In

- **SANDAG** – April de Jesus, Barrow Emerson, Danielle Kochman, Antoinette Meier, Jennifer Williamson
- **MTS** – Oswaldo Meneses, Mark Thomsen
- **Caltrans** – Michael Pickford
- **Kimley-Horn (KHA)** – Edgar Torres, Raymond Lo

2. Study Goals and Overview – Jennifer Williamson, April de Jesus, and Edgar Torres

- Edgar T. provided a re-cap of the field walk: Nobel DAR / Park and Ride, UCSD Circulation, Carroll Canyon DAR
- Jennifer W. and April D. summarized the scope of the project. The overall goal of this study is to identify opportunities to coordinate transit services and provide reliable and safe access to transit in the project area—particular focus being placed on existing and planned BRT services. Some issues include employment centers that are not easily accessible because of topography or location, capacity at UCSD and UTC, and construction schedule coordination. This study will research and identify strategies to capture potential transit ridership by determining alignment options for the BRT using freeway improvements and potential last mile feeder services from BRT stations/ Park & Rides located adjacent to Direct Access Ramps in order to serve widely dispersed destinations within the project area.
- As part of the scope, KHA will summarize successful operating strategies implemented in cities similar to San Diego, where employment centers are spread out in suburban environments. Changes to JARC funding under MAP-21 will also be taken into consideration.

3. Review of Projects (Draft Handout) – Edgar Torres

- Discussed projects in the UTC / Sorrento Valley Community using a draft handout, “Project in the UTC/Sorrento Mesa Communities”.

- Mira Mesa Blvd BRT priority improvements are anticipated July 2014, specifically for Route "470" (as referenced in the RTP). Discussion, led by Barrow E, included if the service would stay on Mira Mesa Blvd or go north into the development — either way the service would utilize transit priority measures along Mira Mesa Blvd, and a bus-only lane connecting westbound Mira Mesa Boulevard to southbound Interstate 805.
  - Also, with the Carroll Canyon DAR expected by 2020, there may be future consideration of serving the southern side of Mira Mesa Blvd. , as there is also development in this area.
  - The I-805/Carroll Canyon north facing DAR currently under construction does not affect our project. Future BRT services will utilize the I-805/Carroll Canyon south facing DAR and the I-805 managed lanes expected in 2020.
- Route 960 will not use Nobel DAR; it will use La Jolla Village Drive interchange.
- MidCoast LRT Project
  - Discussion on whether this study should include impacts north and/or south of La Jolla Village Drive. Jennifer Williamson emphasized that MidCoast was not the focus of the project but how BRT would serve the area and potentially connect with MidCoast.
  - There are multiple opportunities to connections to local bus routes, SuperLoop, and future BRT services.
  - There are currently employer shuttles on Voigt and Executive Drives that are connections to Coaster that could provide other connection opportunities.
- **Action Item –** Caltrans (Michael P.) to provide anticipated completion and construction dates for the Caltrans related projects.
- **Action item –** KHA to review City Community Plans to further develop the project list of the improvements in the area. These projects will be incorporated into the project list handout.
- **Action Item –** KHA to update project list and identify major improvements and phases for each project (e.g. SuperLoop's three phases). Each major improvement/phase will be assigned an index number so that it can be associated with transit services, to be provided on a separate table. Updated infrastructure project list to be e-mailed for staff review by July 12, 2013. Edits to be incorporated by July 15, 2013 and distributed to the attendee list.
- **Action Item –** KHA to develop a table listing existing and anticipated transit services in the planning area. The table will provide a column listing out the infrastructure projects to be utilized by each service.
- **Action Item –** SANDAG to add MidCoast LRT stations to GIS map files provided.

4. Community Planning Group – April de Jesus, Danielle Kochman, Jennifer Williamson

- Community Planning Group meetings included University City, Torrey Pines, and UCSD. SANDAG is currently trying to organize briefings with Mira Mesa Community Planning Group and Mira Mesa Town Council.
  - University City Community Planning Group: Danielle K. and April D. gave an introductory briefing on June 11, 2013. April D. mentioned that during the meeting, a resident requested reinstatement of service on Governor Drive to a senior living community, and concern with the Nobel DAR Park & Ride location because of the sensitive land surrounding it and the far distance from residential areas. Mark T. stated that service on Governor Drive was removed in 2006 due to the unjustified cost of deviating from the route for low ridership.
  - Torrey Pines Community Planning Group: Dave S., Danielle K., and April D. gave a briefing on May 9, 2013. Danielle mentioned that during the meeting, the residents expressed interest in service along Del Mar Heights Road and One Paseo development access.
  - UCSD: Dave S., Jennifer W., and Danielle K. met with Robert Holden (UCSD Auxiliary Business Services) on May 2, 2013. Jennifer mentioned that UCSD is considering turning over transportation services to MTS. Some concerns in this area include students parking in the community to access UCSD and MTS services, a shortage of parking for UCSD shuttle services, lack of east-west connections across campus, lack of services between Carmel Valley and campus, and the service times connecting Pacific Beach to campus and Oceanside to campus. Mark T. clarified that UCSD would like to transition 3 of its routes to MTS. Mark also mentioned that shortage of on-street parking can be attributed to transit passes provided to students only being valid on the "UCSD" routes (i.e. routes that serve the campus).
- Jennifer W. mentioned that UCSD requested information regarding the use of UCSD student ID Cards as Compass Cards. Mark T. stated that the project is moving forward and there will be integration of the transit card with the UCSD student ID cards anticipated by January of 2014. As the UCSD transit pass transitions to a system-wide pass, commuter students from Mission Valley and other major communities to take transit to the university, which will hopefully alleviate the parking shortage problem at the university.
- **Action Item –** MTS will provide an update to the University City Community Planning Group regarding the service and the 2.5 mile deviation created by the previous edition of the service with limited (i.e. very low) ridership

5. Project Updates

- Antoinette M. provided a brief overview about the North Coast Transportation Corridor Project that will mitigate impacts associated with construction. This includes multi-modal trip planning through a web portal that connects employer shuttles, vanpooling and other transit options. The goal is to alleviate traffic impacts during coinciding construction in the project area.
- There was clarification regarding the Genesee Avenue interchange project being separate from North Coast. The project is anticipated to start late-2013 and take 30-36 months to complete. This is the first of many projects in the UCSD area that has prompted discussion by stakeholders (i.e. Sharp and UCSD) on how to get the improvements completed sooner rather than later (and as concurrent as possible)
- Barrow discussed the Mira Mesa Boulevard BRT priority project. SANDAG will be providing a 30-day public input discussion for the environmental document around January 2014. Route 470 is currently in operation. BRT will start a new skip-stop service along the 921 route; SANDAG and MTS are currently discussing whether or not the 921 will be replaced by new services.

6. Action Items and Next Steps

- **Action Item –** Caltrans (Michael P.) to provide anticipated completion and construction dates for the Caltrans related projects.
- **Action item –** KHA to review City Community Plans to further develop the project list of the improvements in the area. These projects will be incorporated into the project list handout.
- **Action Item –** KHA to update project list and identify major improvements and phases for each project (e.g. SuperLoop's three phases). Each major improvement/phase will be assigned an index number so that it can be associated with transit services, to be provided on a separate table. Updated infrastructure project list to be e-mailed for staff review by July 12, 2013. Edits to be incorporated by July 15, 2013 and distributed to the attendee list.
- **Action Item –** KHA to develop a table listing existing and anticipated transit services in the planning area broken down by service operation dates. The table will also provide a column listing out the infrastructure projects to be utilized by each service.
- **Action Item –** SANDAG to add MidCoast LRT stations to GIS map files provided.
- **Action Item –** MTS will provide an update to the planning group regarding the service and the 2.5 mile deviation created by the previous edition of the service with limited (i.e. very low) ridership.
- **Next Step** – KHA to provide redlines on project mapping.
- **Next Step** – SANDAG to update mapping of projects including opening dates for local/BRT Routes (existing and proposed)
- **Next Step** – KHA to identify alternative operating strategies including best practices and approach to these operating strategies.
- **Next Step** – SANDAG will create webpage and include graphics.
- Next meeting will be push back a week to July 16th from 1:30 to 2:30 pm in conference room 10C of the 10th floor of SANDAG's building.

Meeting End – 2:30 pm

Meeting #1

July 16, 2013 –1:30 to 2:30 pm
SANDAG Office – 401 B Street Suite 1000, Conference Room 10C
Conference # - 619-595-5385

1. **Kick-Off Meeting Recap**
   - Kick-Off meeting minutes (06-26-2013) final comments due 07-19-2013.
2. **Action Items**
   - Action Item List (Draft Handout #1)
3. **Review of Projects**
   - Infrastructure Projects in UTC / Sorrento Mesa Communities (Draft Handout #2)
   - Transit Infrastructure Utilization Table (Draft Handout #3)
4. **Updates**
   - Community Planning Group
   - Alternative operating strategies approach
5. **Next Steps/Action Items**
   - Recap Meeting Action items
   - Next Meeting – Tuesday, August 13, 2013

Next Meeting – Tuesday, August 13, 2013 – 1:30 to 2:30 pm

Meeting #1 Notes
July 16th, 2013 – 9:00 to 10:00 am
SANDAG Office – 401 B Street Suite 1000, Conference Room 10C

Meeting Start – 9:00 am

1. Introductions / Check-In

- **SANDAG** – April de Jesus, Barrow Emerson, Danielle Kochman, Jennifer Williamson
- **MTS** – Oswaldo Meneses, Mark Thomsen
- **Caltrans** – Michael Pickford
- **City of San Diego** – Steve Celniker
- **Kimley-Horn (KHA)** – Edgar Torres, Raymond Lo

2. Kick-off Meeting Recap

- Kick-off meeting minutes (June 26th) comments and edits are due to KHA on July 19th. After this review period, the kick-off meeting minutes will be considered final.
- MTS action item regarding the 2.5 mile deviation is now considered complete. During the UTC planning committee meeting, the subject matter did not come up.
- **Action Item –** KHA will now include a hardcopy of previous meeting minutes at every PDF meeting.
- **Action Item –** KHA will update action items list.

3. Review of Projects

- The infrastructure project list and transit utilization table were submitted as preliminary draft handouts on July 15th. Edits and comments will continue to be incorporated to these two tables.
- **Action Item –** KHA will include the stops from Phase III of Superloop, which includes the La Jolla Colony expansion, to the infrastructure project list.
- **Action Item –** KHA will update GIS maps for all horizon years with the stations provided by SANDAG.

4. City Plans

- KHA reviewed the city plans for any goals or initiatives that may affect the BRT service. For Sorrento Valley, it was found that they will be doing some reclassification of streets to fit a larger capacity. For University City, they will be implementing Class II bike lanes. For La Jolla, it was found that they will implement shuttle busing to peripheral areas to the community.
- The review of the city plans confirmed that there were no city goals or initiatives that would either help or deter BRT improvements.
- **Action Item –** KHA will submit a working draft of the consolidated goals and initiatives from the city plans on July 17th.

5. "Best Practices"

- KHA has been reviewing last mile "best practices" through a literature review and conversation with the agencies that implemented these best practices. The cities reviewed were the San Francisco Bay Area, Denver, Minneapolis, and Minnesota.
- Many of the long distance commute patterns found in the reviewed cities is similar to San Diego, especially once Mid-Coast is implemented.
- Outreach to the employees, especially having a dedicated person to provide the resources have been pushed by agencies of these cities. A "transit concierge" would be able to provide these services that are similar to iCommute and 511, but is more welcoming to new transit users.
- **Action Item –** KHA will follow up with Antoinette Meier to dissolve some of the employer and employee transportation practices.
- **Action Item –** KHA will send the last mile "best practices" table by the end of the meeting day (July 16th).

6. Alternative Operating Strategies Approach

- Four Strategies Approach:
  1. Trunk + Feeder System (Ex. Coaster and Coaster Shuttle)
  2. Nodal / Destination Focus Operating Approach
  3. Multimodal Approach (Ex. Car-share, Bike-share, leveraging BRT stations)
  4. Hybrid of the first three strategies
- Operating approaches will present the opportunities and constraints of several points of interest, such as the deviations for Mira Mesa Boulevard for the BRT.

- **Action Item –** KHA will provide a working draft of the strategies and maps of those strategies a week before the August meeting on August 7th or August 8th.

7. Action Items and Next Steps

- **Action Item –** KHA will now include a hardcopy of previous meeting minutes at every PDF meeting.
- **Action Item –** KHA will update action items list.
- **Action Item –** KHA will include the stops from Phase III of Superloop, which includes the La Jolla Colony expansion, to the infrastructure project list.
- **Action Item –** KHA will update GIS maps for all horizon years with the stations provided by SANDAG.
- **Action Item –** KHA will submit a working draft of the consolidated goals and initiatives from the city plans on July 17th.
- **Action Item –** KHA will follow up with Antoinette Meier to dissolve some of the employer and employee transportation practices.
- **Action Item –** KHA will send the last mile "best practices" table by the end of the meeting day (July 16th).
- **Action Item –** KHA will provide a working draft of the strategies and maps of those strategies a week before the August meeting on August 7th or August 8th.
- **Next Step** – KHA to provide redlines on project mapping.
- **Next Step** – SANDAG to update mapping of projects including opening dates for local/BRT Routes (existing and proposed)
- **Next Step** – KHA mold alternative operating strategies with comments from the PDT
- **Next Step** – SANDAG will create webpage and include graphics.
- Next meeting Tuesday, August 13, 2013 from 1:30 to 2:30 pm.

Meeting End – 10:00 am

Charrette Meeting Notes
August 29th, 2013 – 1:00 to 3:30 pm
SANDAG Office – 401 B Street Suite 500, Conference Room 5B

Meeting Start – 1:00 pm

1. Introductions / Check-In

- **SANDAG** – April de Jesus, Barrow Emerson, Dave Schumacher, Danielle Kochman, Jennifer Williamson
- **MTS** – Oswaldo Meneses, Mark Thomsen
- **Caltrans** – Michael Pickford
- **City of San Diego** – Steve Celniker
- **Kimley-Horn (KHA)** – Edgar Torres, Raymond Lo

2. Handouts

- Charrette Meeting Agenda
- Meeting #1 minutes (7/16/2013)
- Alternative BRT Service Strategies Charrette – Operating Strategies Descriptions
- Operating Strategies Legend
- Infrastructure Improvements + BRT Mapping Development Packet
    1. Infrastructure Project List
    2. Infrastructure Project Timeline
    3. Transit Utilization Table
    4. Index Infrastructure 2020 BRT Map
    5. Route 680 BRT Route Map
    6. Route 688 BRT Route Map
    7. Route 689 BRT Route Map
    8. Route 870 BRT Route Map
    9. Route 470 BRT Route Map

3. Full-Sized Maps

- 2020 Regional Transit Map
- Route 680 BRT Route Map
- Route 688 BRT Route Map
- Route 689 BRT Route Map
- Route 870 BRT Route Map
- Route 470 BRT Route Map
- Region Land Use Map
- Index Infrastructure 2020 BRT Map
- Walking Buffer with BRT Stations
- Pedestrian Barriers
- Restaurant Locations
- Project Area Aerial

4. Trunk and Feeder Strategies (Highlight = Priority Strategy)

- Route 680
  1. Only go into Sorrento Valley during the peak
  2. Have route go to UTC
  3. Have route serve UCSD
  4. Start service at Palomar DAR and go to UTC
- Route 470
  1. Have route serve UCSD
  2. All Day Service – Demand Based
  3. Mira Mesa as a Branded Trunk
- Route 688
  1. Create Deviation off Nobel Drive, which connects with 689 + 870
- Route 689
  1. Have route serve UCSD (West)
  2. There is a transfer point at 689 + 688
  3. Go through Eastgate + Judicial to get to North Torrey Pines
- Route 870
  1. Needs to connect to UTC (Regional Hub)

5. Nodal (Highlight = Priority Strategy)

1. SuperLoop as Anchor
2. Connect Sorrento Valley Circulator to UTC (Mid-Day)

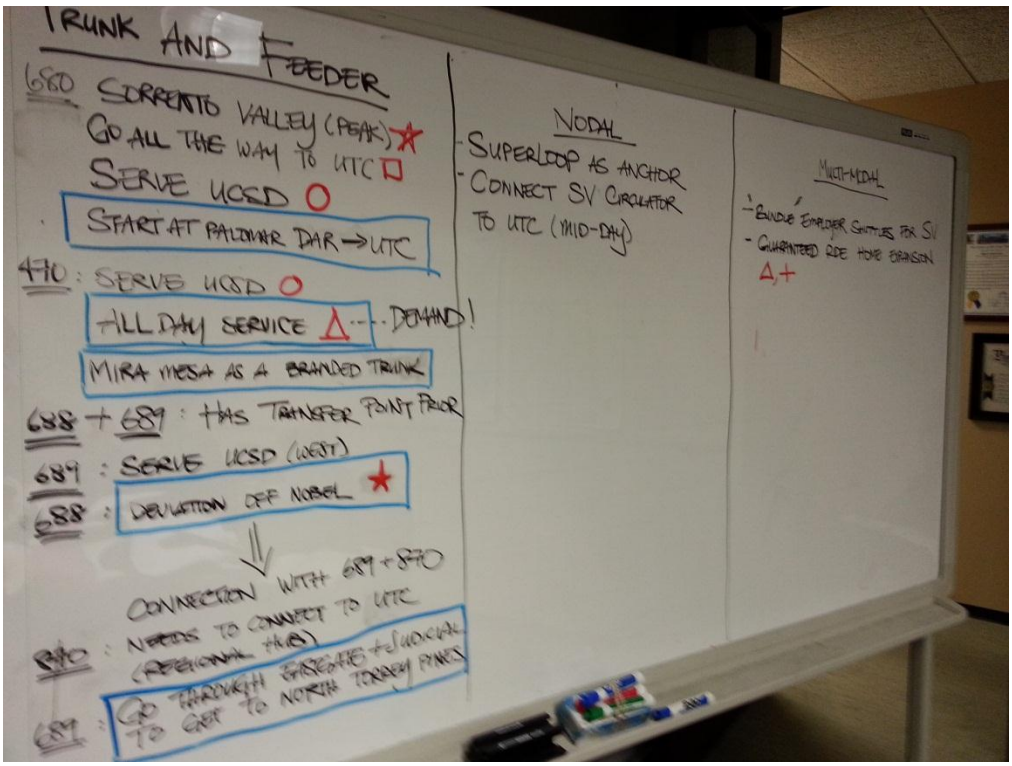
6. Multi-Modal (Highlight = Priority Strategy)

1. "Bundle" employer shuttles for Sorrento Valley
2. Guaranteed Ride Home Expansion

7. Action Items and Next Steps

- **Action Item –** KHA will implement the operating strategies that are prioritized to the GIS map, in preparation for the next Charrette.
- **Action Item –** KHA will add Route 921 to the Route 470 Map
- **Action Item –** KHA will add infrastructure #22 to the Route 470 Map
- **Action Item –** KHA will add Route 50 + 150 + 960 to the Regional Map
- **Action Item –** KHA will prepare a transfer opportunity matrix (with start and end points)
- **Action Item –** KHA will prepare a peak versus off-peak map
- **Next Step –** Charrette Meeting #2 on September 10th, 2013

Meeting End – 3:30 pm



Operating Strategies Table Photo

Charrette Meeting
August 22, 2013 – 1:00 to 3:30 pm
SANDAG Office – 401 B Street Suite 500, Conference Room 5B
Conference # - 619-595-5385

1. **Meeting #1 Recap**
   - Meeting #1 minutes (07-16-2013) final comments due 08-29-2013.

2. **Reacquaint with 2020 BRT Routes**
   - *Full-Size Map: Regional BRT Map*

3. **Trunk and Feeder Strategy**
   - Potential route changes for base trunk lines and station locations
   - Discuss feeders to support base trunk lines
   - Strategy Table Category: Trunk and Feeder
   - *5 Individual BRT Route Maps*

4. **Nodal + Multi-Modal Strategies**
   - Strategy Table Category: Nodal + Destination Based
   - Strategy Table Category: Multi-Modal + Last Mile
   - *Full-Sized Maps: BRT Alignment with Infrastructure Index, Walking Buffer (Aerial), Walking Buffer (BRT Stations), Pedestrian Barriers, Restaurant Location, Complete Aerial*

5. **Prioritization of Strategy Elements**
   - Prioritize features and elements from each strategy category

Charrette Meeting #2

September 10, 2013 – 1:30 to 2:30 pm
SANDAG Office – 401 B Street Suite 1000, Conference Room 10C
Conference # - 619-595-5385

1. **SANDAG Updates**
   - North Coast Corridor Transportation Demand Management (TDM) Update

2. **Recap - Charrette Meeting #1**
   - Charrette Meeting #1 minutes (08-22-2013) final comments due 09-17-2013
   - Recap - Trunk and Feeder Strategies

3. **Nodal / Circular Strategies**
   - SuperLoop
   - Sorrento Valley Circular Shuttle
   - UCSD Hospitals Circular Shuttle

4. **Multi-Modal Strategies**
   - Coordination with NCC TDM Plan – Golden Triangle

5. **Prioritization of Strategy Elements**
   - Prioritize features and elements from each strategy category

Charrette Meeting #2 Meeting Notes
September 10, 2013 – 1:30 to 2:30 pm
SANDAG Office – 401 B Street Suite 1000, Conference Room 10C

Meeting Start – 1:30 pm

1. Meeting Attendees

- **SANDAG** – April de Jesus, Barrow Emerson, Christine Eary, Dave Schumacher, Danielle Kochman, Deborah Jones, Jennifer Williamson
- **MTS** –Mark Thomsen
- **Caltrans** – Michael Pickford
- **City of San Diego** – Steve Celniker
- **Kimley-Horn (KHA)** – Edgar Torres, Raymond Lo

2. Recap - Charrette Meeting #1

- Last month's meeting focused on developing trunk and feeder strategies
- The two main achievements of the trunk of feeder strategies were:
  - Creating a strong all day network in the project area by developing routes 680 and 470;
  - Establish Nobel Drive DAR and Westfield UTC as the two main transfer hubs in relation with the peak-period only express routes.

3. 2020 Path Choice Matrices

- Comparison of peak period system versus off-peak period system
- The peak-period system has a majority of origin-destinations being served by a "one-seat ride" or one transfer
- The off-peak period system has major gaps in serving: Solana Beach Coaster Station, Qualcomm North of Lusk, North Campus Point Drive, and Scripps Green Hospital. Several trips require two transfers during the off-peak period.
  - Some of the off-peak period service gaps for the coaster may be served by a proposed all-day rail-to-rail service from the coaster. Details of the service will be clearer in the upcoming weeks.
  - The Nodal/Circular operating strategies will serve to fill the remaining service gaps.

4. Nodal/Circular Operating Strategies

- SuperLoop
- Sorrento Valley Shuttle System
  - Circular, all-day system
  - The shuttle would have service through Barnes Canyon Road and Scranton Road
  - Shuttle system has the possibly of building off of Qualcomm's existing shuttle system
  - Service gaps in this area may also be served by Route 921 now that BRT Route 470 is now providing all-day service
- UCSD West/North Torrey Pines Road Shuttle System
  - Hospitals experience an early A.M. peak period at 5:30 AM while an early P.M peak period at 3:30 P.M. when many hospital staff have a shift change
  - Will serve Scripps Memorial Hospital La Jolla, Scripps Green Hospital, and possibly VA Medical Center
  - Route 101 may be a future BRT route which currently provides service from Oceanside Transit Center to V.A. Medical Center/Westfield UTC. However, there may be a span of service issue for hospitals with the route.
- **Action item** - KHA will include MTS Route 101 to 2020 Project Area Map with Index Numbers
- **Action item** - KHA will add two shuttle loops to 2020 Project Area Map with Index Numbers

5. Multi-Modal /Last Mile Operating Strategies

- North Coast Corridor TDM Plan Update:
  - Guaranteed Ride Home is being expanded to all forms of transit instead of just express routes
  - Market alternative transportation to employee staff in the area
  - Social media strategy for Golden Triangle area
  - Branding for TDM plan while construction of I-5/Genesee occurs
  - Limited residential land use in the project area
  - Will work with UCSD student to market alternative transportation modes

6. Safe Active Transit Project

- Currently in Phase 1 (October 4th) to identify project list
  - Possible case studies in Sorrento Valley (Qualcomm area), Scripps Green Hospital, and UTC
- Phase II will look at bike/walk access, identify bike/walk routes and look for pedestrian/biking barriers
- **Action item** - KHA will coordinate the proposed stations and stops with Christine Eary

7. Possible Coaster Extension for BRT Route 688

- Creates opportunity to connect Coaster during the off-peak period
- There must a balance between the costs associated with the additional deadhead time and the additional connection to Coaster
- Possibility of only having the service when it matches up with the Coaster arrival times at the station.

8. Action Items and Next Steps

- **Action item** - KHA will include MTS Route 101 to 2020 Project Area Map with Index Numbers
- **Action item** - KHA will add two shuttle loops to 2020 Project Area Map with Index Numbers
- **Action item** - KHA will add South Bay BRT to the Regional Map
- **Action item** - KHA will coordinate the proposed stations and stops with Christine Eary
- **Next Steps** – Cost out the strategies being implemented through the trunk and feeder/nodal strategies
- **Next Steps** – Prioritize strategies and expand its context
- **Next Steps** – Charrette Meeting #3: Tuesday, October 8th, 2013 – 1:00 to 3:00 P.M. in SANDAG conference room 10C

Meeting End – 2:30 pm

Charrette Meeting #3
October 25, 2013 – 1:30 to 3:30 pm
SANDAG Office – 401 B Street Suite 1000, Conference Room #10C
Conference # - 619-595-5385

1. **Charrette Meeting #2 Recap**

   - Meeting Notes: Charrette Meeting #2 notes (09-10-2013) final comments due 10-25-2013.

2. **Overview of Operating Strategies**

   - Full-Size: Project Area Map with Infrastructure Index
   - Full-Size: Regional Map
   - Full-Size: Updated Regional Map with Inset

3. **Phasing Strategies**

   - Develop phasing strategies for implementation of operating strategies

4. **Cost Assumption Parameters**

   - Develop operating and capital cost assumption parameters to be utilized in cost estimates

5. **Community Planning Group**

   - Community planning group updates

6. **Next Steps and Actions Items**

   - **KHA:** Operating and Capital Cost Estimates (Submit Draft to PDT on November 15th)

Charrette Meeting #3 Meeting Notes
October 25, 2013 – 1:30 to 3:00 pm
SANDAG Office – 401 B Street Suite 1000, Conference Room 10C

Meeting Start – 1:30 pm

1. Meeting Attendees

- **SANDAG** – April de Jesus, Dave Schumacher, Danielle Kochman, Jennifer Williamson, Tedi Jackson
- **MTS** – Oswaldo Meneses, Mark Thomsen
- **Caltrans** – Michael Pickford
- **City of San Diego** – Steve Celniker
- **Kimley-Horn (KHA)** – Edgar Torres, Raymond Lo

2. Recap - Charrette Meeting #2

- Last month's meeting focused on developing multi-model / last-mile operating and nodal strategies
- The two main achievements of the strategies were:
  - Establishing a possible Sorrento Valley and UCSD West/North Torrey Pines Road Shuttle System network
  - Create a foundation for integrating the TDM Plan with transit in the project area

3. Recap – Employer's Perspective: Meeting with Deborah Jones

- Met on Tuesday, October 22nd to discuss which routes should move forward first from an employer's perspective
  - Deborah has been hearing a lot of discussion of Route 470, so that route should be first priority
- Deborah believes that South Bay is another priority because of the traffic currently being experienced on the I-805
  - This puts the focus on Route 688 for peak-only first, and then on the all-day Route 688 service
- **Action item** – Coordinate with Deborah Jones to obtain information from employees: shift times, starting zip codes, income, auto access.

4. Updated Regional Map with Inset

- An updated regional map with an inset of the project has been produced for SANDAG's meeting with interim Council President Sherri Lightner
- The I-15 BRT for all-day and peak-period should be Rapid A and Premium Express respectively
- Nobel Drive acts a transfer point for all BRT services in the project area, except for Route 470 which ends at UCSD with a transfer opportunity at La Jolla Village Drive
- **Action item** - KHA will integrate all changes to the updated regional map with inset.

5. Phasing Strategies

- Route 470 (peak-only) service anticipated September 2014; future improvements include transition to all day service when funding is available
- Route 680 (peak-only) service anticipated in 2015; and transition to all day service in 2030 when funding may be available
  - Possibility for Route 680 to go to Campus Point Drive for short term
- It is ideal for 688 to be phased with Plaza Blvd In-Line Station
  - Route 688 has advantage of expanding the scope of network.
  - Concern over San Ysidro the infrastructure there to support Route 688
  - Concerns over whether Route 688 is faster than Mid-Coast
  - The timing of Route 688 is solely dependent on fleet procurement
- Demand for service from National City to the Sorrento Valley area is just as strong as the rest of South Bay, and service should be expanded there to provide balanced service to communities East and West of the I-805
  - Possibility to extend Route 960 south, Highland Avenue
  - Possibility to extend Route 150 to National City
- Route 870 is not a part of TransNet funding, and depending on funding opportunities, may not come into service until 2030.
- Phasing:
  - General consensus for how phasing should work from the PDT group: 470 → 680 (through Mid-City and up to Campus Point Drive) → 870 → 688 → 689
  - However, it is acknowledged that this is not consistent to the RTP via TransNet funding

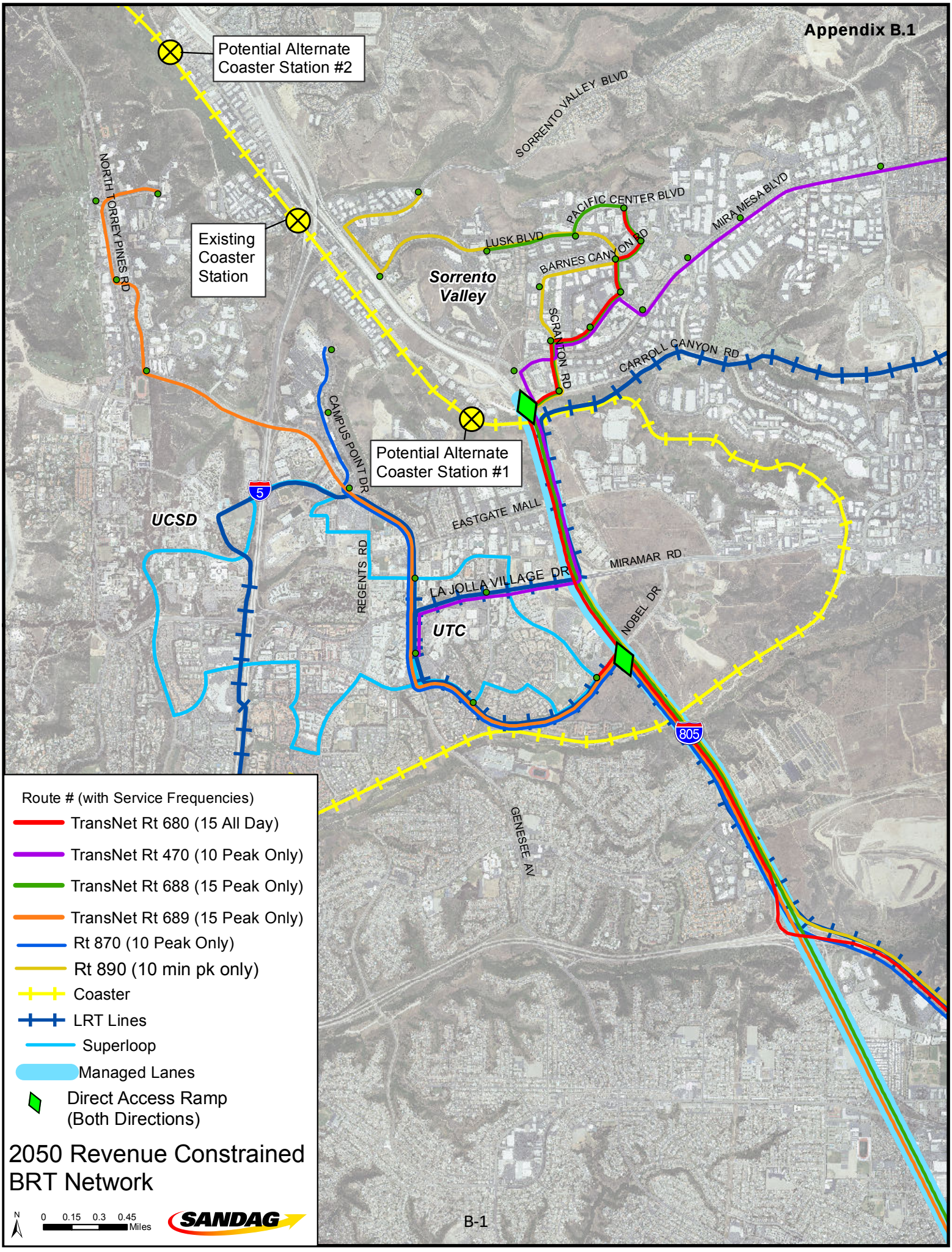
6. Cost Assumption Parameters

- Price out infrastructure to put the routes in place.
- Price out bus lanes, arterials, investments would cost.
- Price out the 2 addition shuttle loop services for 2015 (Sorrento Valley and UCSD West).
- Price out all day service for Route 470 for 2020 based on information from MTS.
- **Action item** – MTS to submit the Route 470 service package to SANDAG.

7. Action Items and Next Steps

- **Action item** – Coordinate with Deborah Jones to obtain information from employees: shift times, starting zip codes, income, auto access.
- **Action item** - KHA will integrate all changes to the updated regional map with inset.
- **Action item** - KHA will develop operating and capital cost estimates.
- **Action item** – MTS to submit the Route 470 service package to SANDAG.
- **Next Steps** – Schedule meeting with Deborah Jones.
- **Next Steps** – Schedule re-cap meeting with SANDAG and KHA.
- **Next Steps** – Charrette Meeting #4: Tuesday, November 19th, 2013 – 12:30 to 2:00 pm in SANDAG conference room 10C

Meeting End – 3:10 pm


Potential Alternate Coaster Station #2
Existing Coaster Station
Potential Alternate Coaster Station #1
SORRENTO VALLEY BLVD
NORTH TORREY PINES RD
PACIFIC CENTER BLVD
LUSK BLVD
BARNES CANYON RD
MIRA MESA BLVD
Sorrento Valley
SCRANTON RD
CARROLL CANYON RD
CAMPUS POINT DR
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UCSD
EASTGATE MALL
REGENTS RD
MIRAMAR RD
LA JOLLA VILLAGE DR
NOBEL DR
UTC
805
GENESEE AV
Route # (with Service Frequencies)
TransNet Rt 680 (15 All Day)
TransNet Rt 470 (10 Peak Only)
TransNet Rt 688 (15 Peak Only)
TransNet Rt 689 (15 Peak Only)
Rt 870 (10 Peak Only)
Rt 890 (10 min pk only)
Coaster
LRT Lines
Superloop
Managed Lanes
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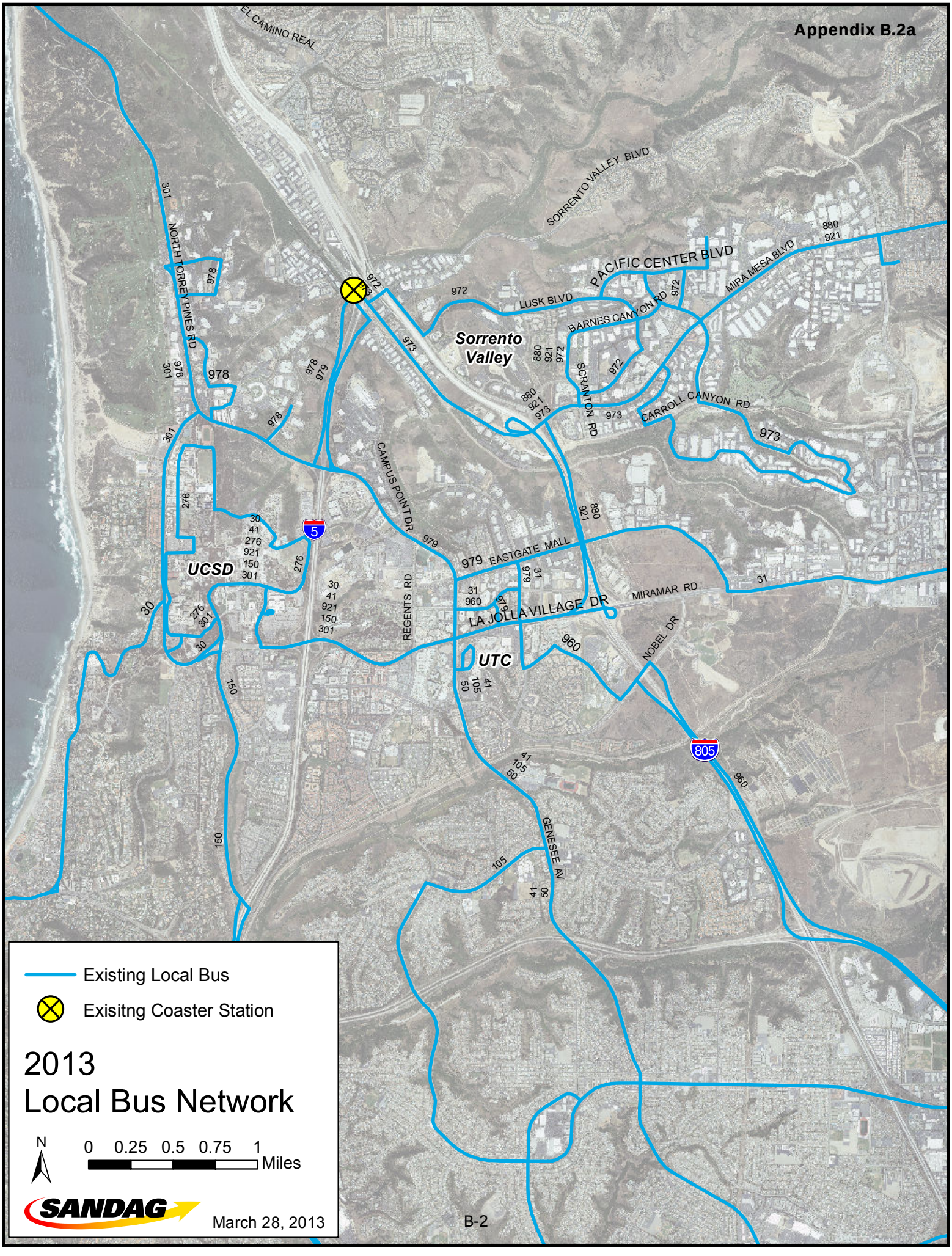
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NORTH TORREY PINES RD
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REGENTS RD
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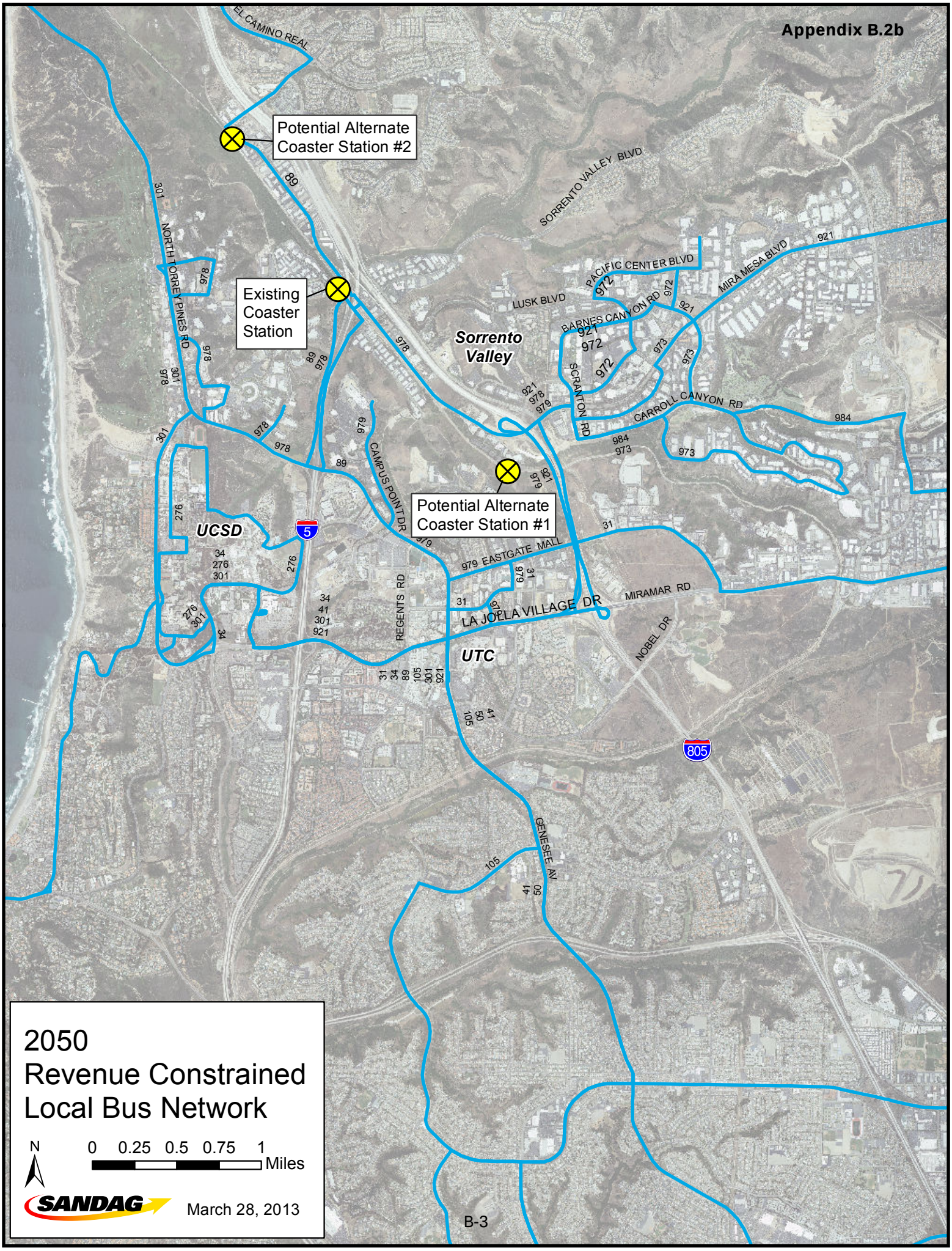
March 28, 2013


Potential Alternate Coaster Station #2
Existing Coaster Station
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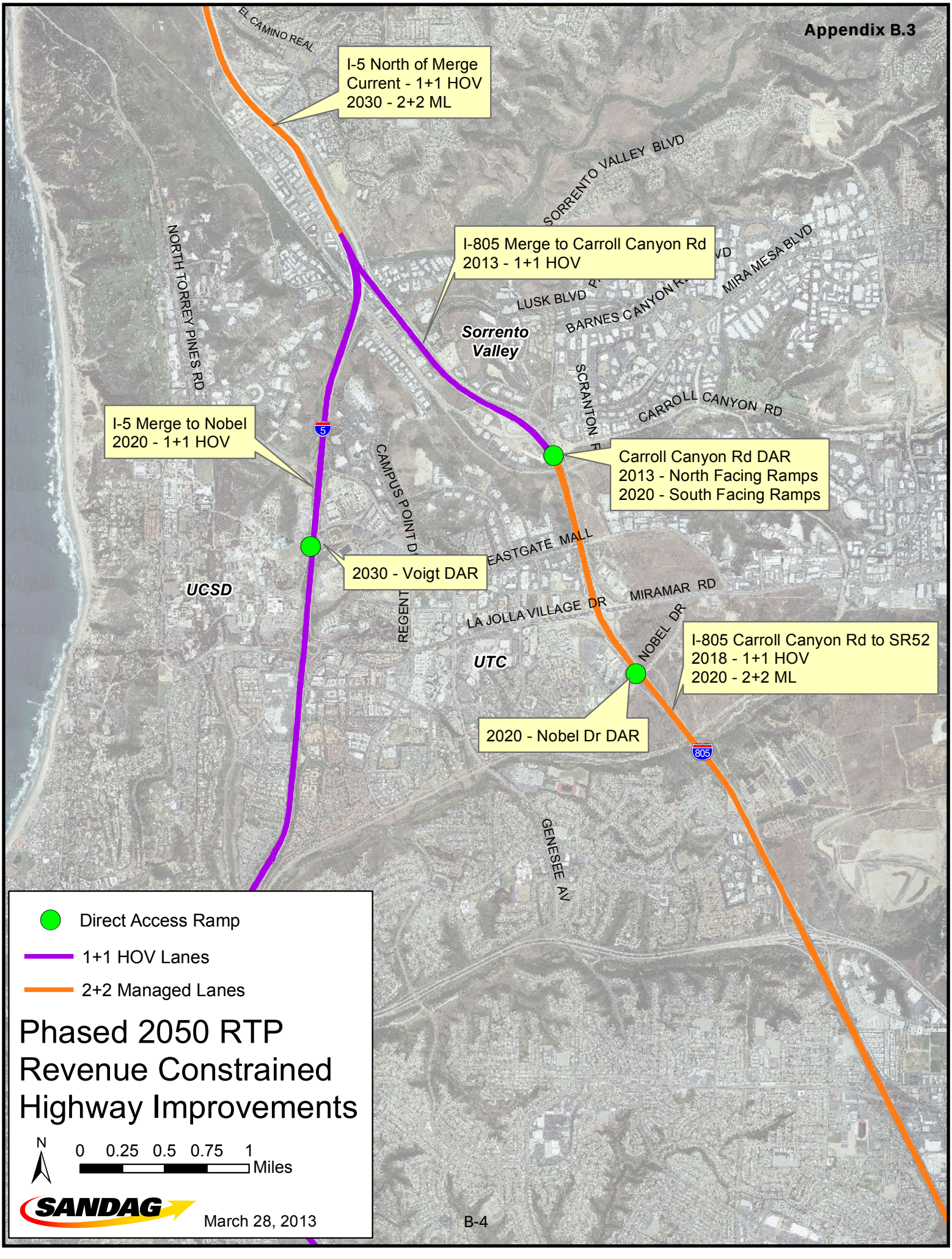
I-5 North of Merge
Current - 1+1 HOV
2030 - 2+2 ML
I-805 Merge to Carroll Canyon Rd
2013 - 1+1 HOV
I-5 Merge to Nobel
2020 - 1+1 HOV
Carroll Canyon Rd DAR
2013 - North Facing Ramps
2020 - South Facing Ramps
2030 - Voigt DAR
I-805 Carroll Canyon Rd to SR52
2018 - 1+1 HOV
2020 - 2+2 ML
2020 - Nobel Dr DAR
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LUSK BLVD
BARNES CANYON RD
MIRA MESA BLVD
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SCRANTON RD
CARROLL CANYON RD
CAMPUS POINT DR
EASTGATE MALL
UCSD
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LA JOLLA VILLAGE DR
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Highway Improvements
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SANDAG
March 28, 2013

San Diego
ASSOCIATION OF GOVERNMENTS

MEMO

3321001

SUBJECT: North University Town Center (UTC)/Sorrento Valley Transit Study Task One: Inventory and Matrix of Transit Services within the Project Area

The first task in SANDAG's study to evaluate transportation options for the North Interstate 805 (I-805) corridor and Sorrento Valley is to create an inventory of all planned services within the project area. There are also a number of major freeway infrastructure projects under construction or in final design along the north I-805 corridor. This study will consider infrastructure improvements when refining Bus Rapid Transit (BRT) alignments in order to effectively utilize these infrastructure projects and improve efficiency of the BRT service. Therefore, this task also required the identification and mapping of freeway improvements that impact the provision of transit (e.g., Direct Access Ramps, HOV/Managed Lanes).

Task 1.1 – Identify and map all planned BRT services outlined in SANDAG's 2050 Regional Transportation Plan (RTP)

The following BRT Routes included in the 2050 RTP serve the project area:

Route #	Description	Decade	Span
470	Escondido to UTC/UCSD via Mira Mesa Boulevard	2018	Peak
680	Otay Mesa to Sorrento Mesa via I-805 Corridor, Otay Ranch/Milenia, National City, Southeastern San Diego, Mid-City, Kearny Mesa	2018	All Day
688	San Ysidro to Sorrento Mesa Express	2018	Peak
689	Milenia/Otay Ranch to UTC/Torrey Pines Express	2018	Peak
870	El Cajon to UTC via Santee, SR 52, I-805	2020	Peak
890	El Cajon to Sorrento Mesa via SR 52, Kearny Mesa	2030	Peak

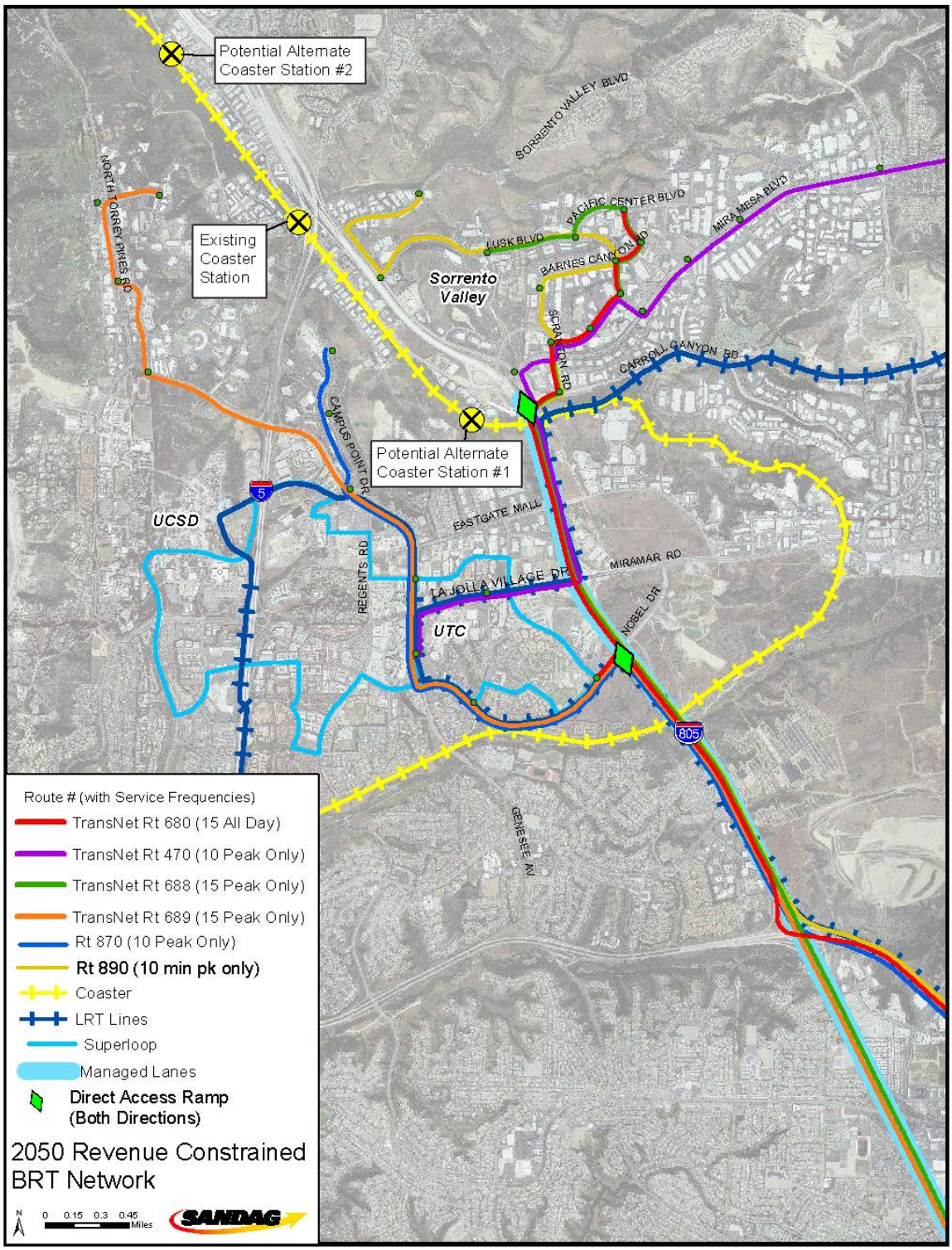
These services, including frequencies are mapped in Figure 1.

While the previously mentioned routes are included in the 2050 Revenue Constrained Transit Network, specific funding has only been identified for some of these routes. The *TransNet* Extension & Ordinance includes capital funding for two BRT services serving the project area:

- Escondido to Sorrento Mesa using the managed lanes on I-15
- San Ysidro to Sorrento Mesa using the managed/HOV lane facilities on I-805/I-15/SR-52

7.9 percent of total *TransNet* revenues are available for operating support for *TransNet* capital projects, including the two previously mentioned projects. However, the *TransNet* extension does not include specifics of the operating plans, such as span of service or frequency. SANDAG has developed a cost model to distribute projected available funding across all *TransNet* transit capital projects. The cost model includes funding for peak period service with 15 minute headways for the two BRT projects discussed here.

Figure 1: 2050 Revenue Constrained BRT Network



Task 1.2 – Map existing and proposed local services and work with the Metropolitan Transit System to identify if any route modifications are proposed

SANDAG developed a map of existing local service in the project area (Figure 2) and a map of proposed local service in the 2050 RTP (Figure 3)

Figure 2: Existing Local Transit Service Network

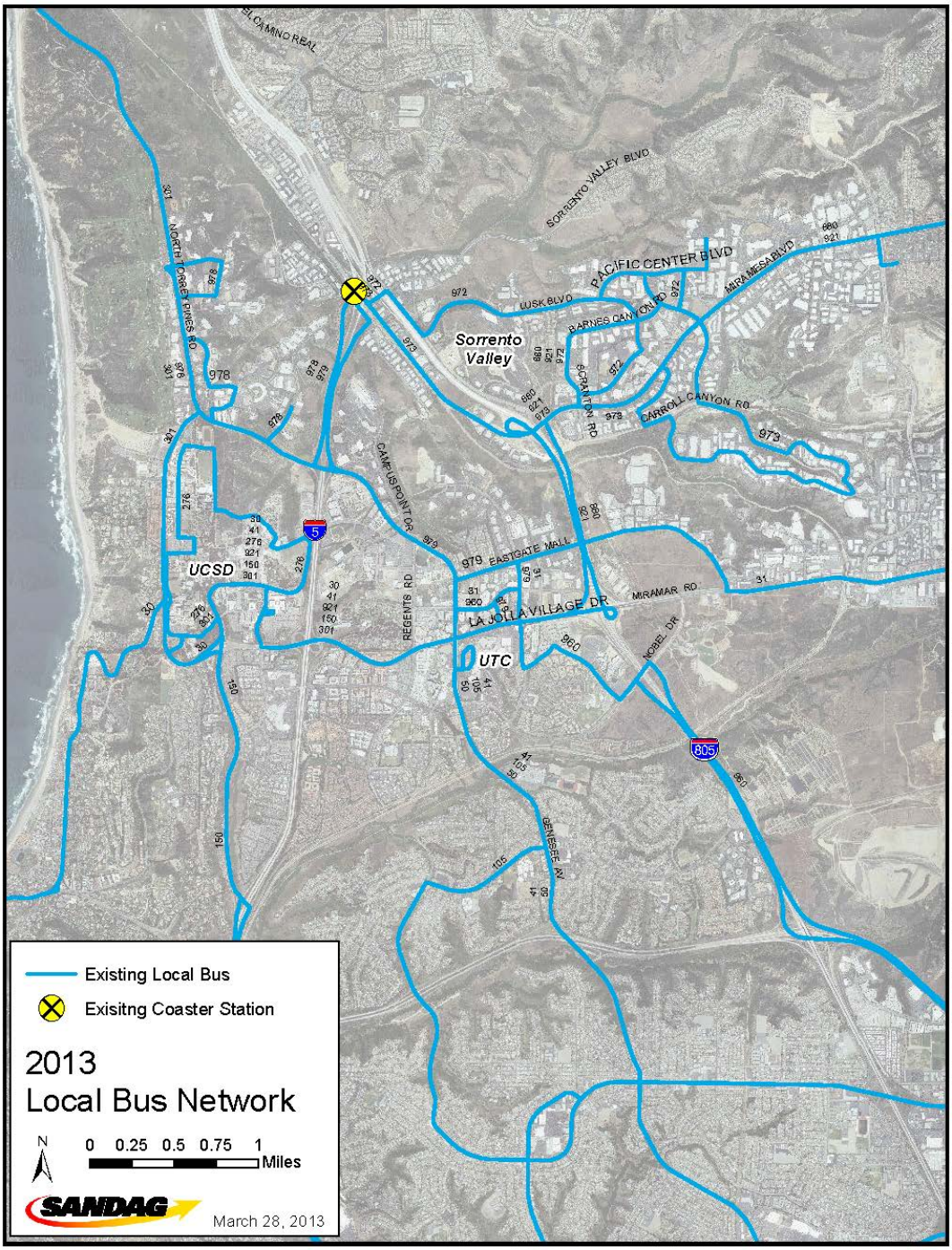
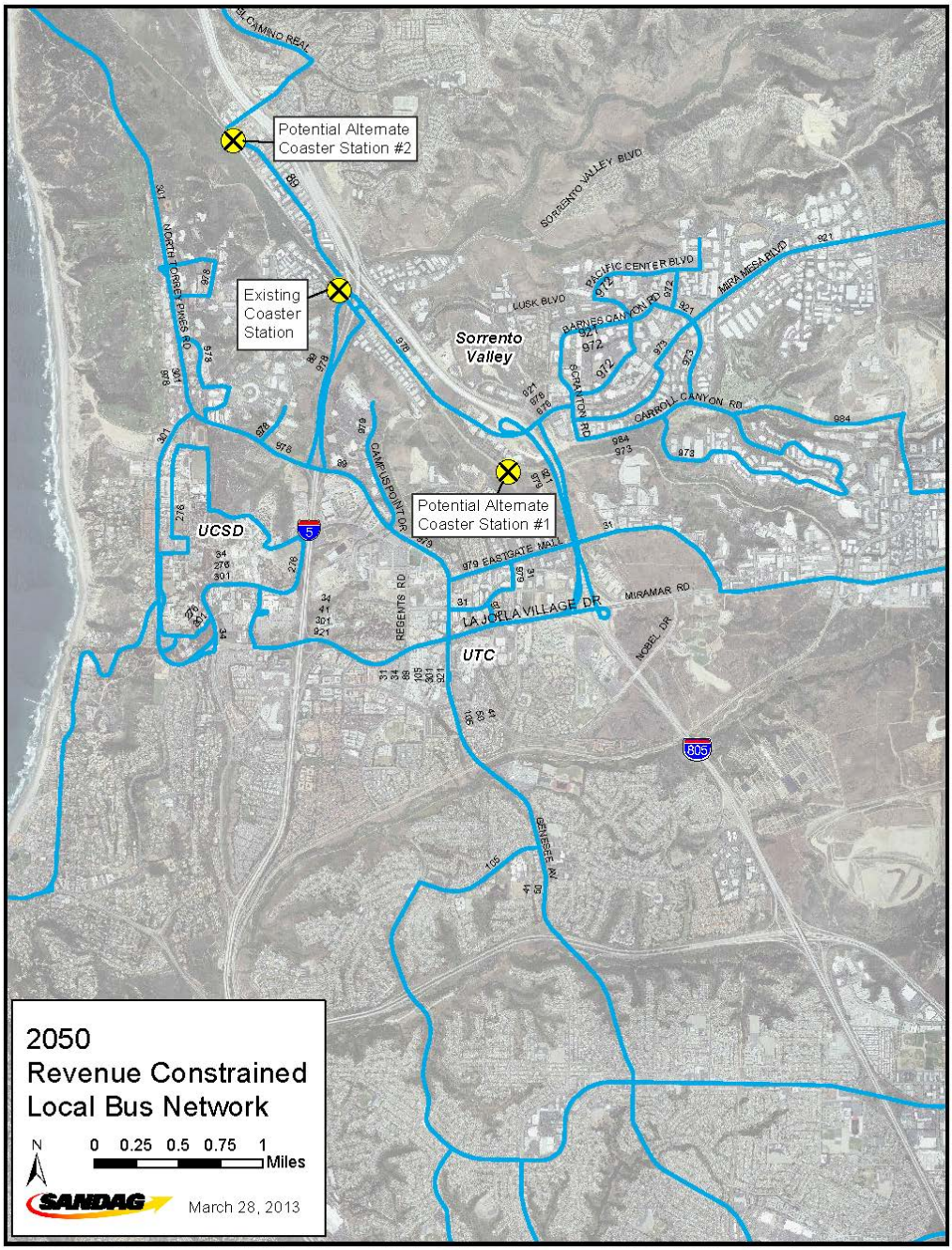


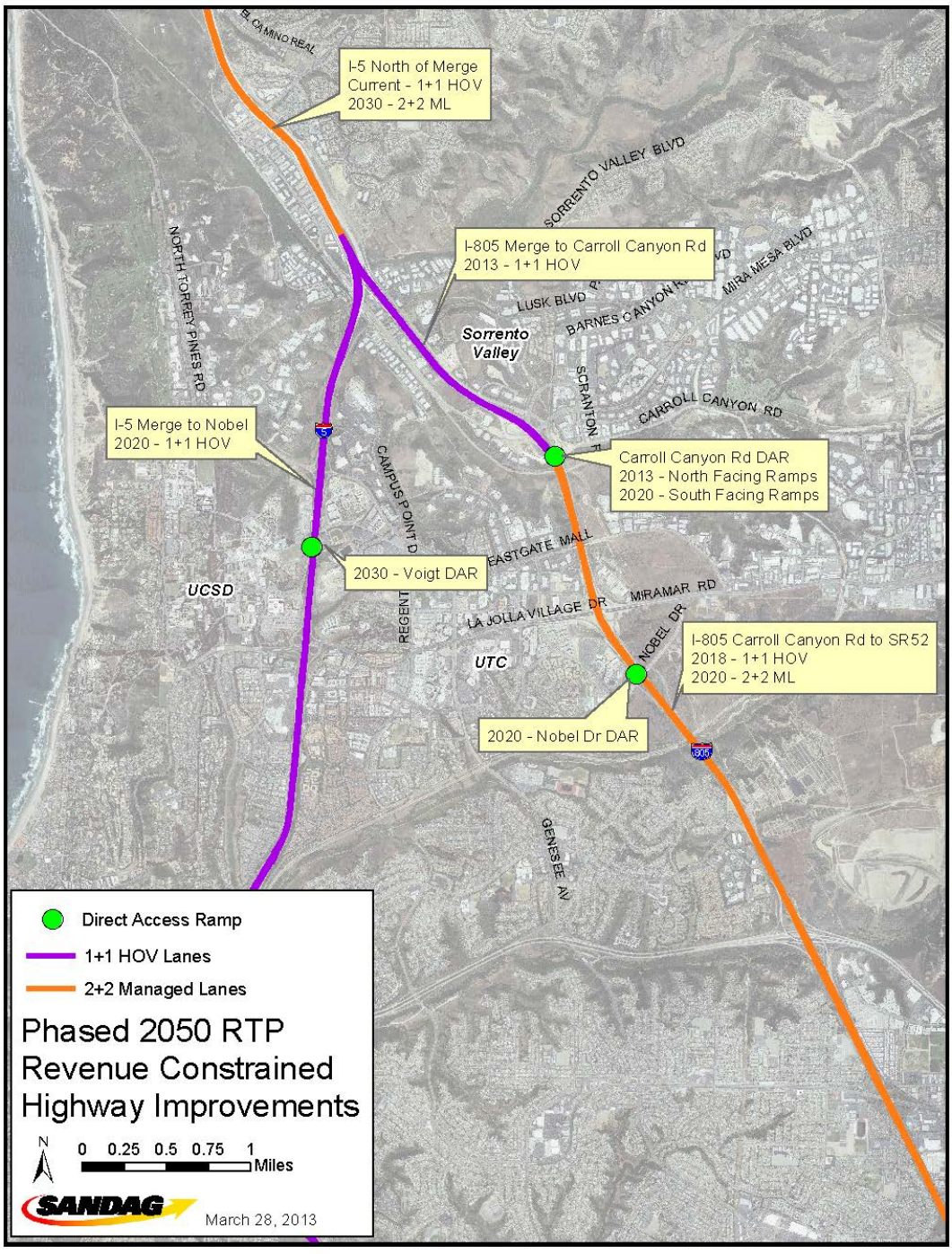
Figure 3: 2050 RTP Local Transit Service Network



Task 1.3 – Identify and map all north I-805 freeway corridor improvements that directly impact the provision of transit

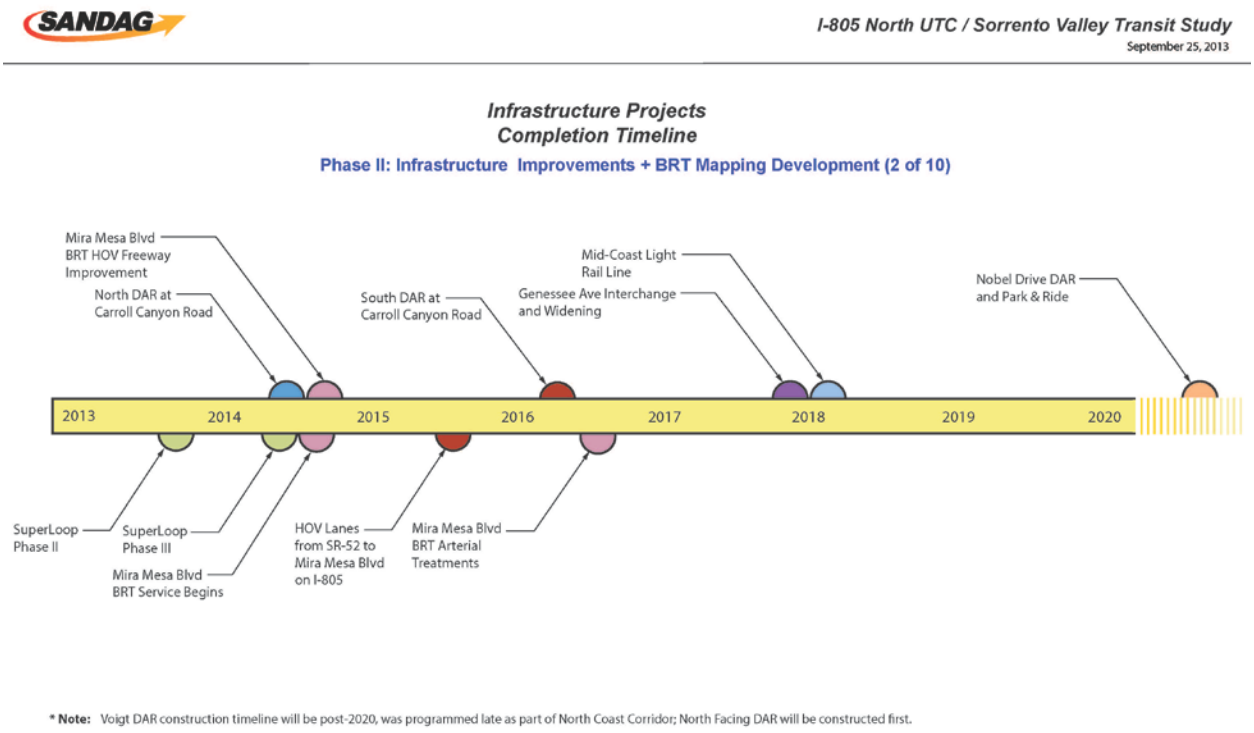
As a baseline for re-evaluating the service alignments for the previously mentioned BRT services, an inventory of freeway corridor improvements that might improve the provision of these transit services was developed. Figure 4 maps relevant north I-805 freeway corridor improvements.

Figure 4: Map of North I-805 Freeway Improvements



This map details the highway improvements as phased in the 2050 RTP. Funding constraints have delayed a number of these projects, so an updated timeline was developed (Figure 5).

Figure 5: Infrastructure Projects Completion Timeline



Additionally, a matrix was developed that detailed all infrastructure improvements, including transit stations and arterial projects in addition to freeway projects planned in the project area. This matrix (Figure 6) includes the project name and description, the project status, and an index number that corresponds to the location on maps with proposed BRT alignments developed for Task 2.

Figure 6: Infrastructure Project Matrix

Infrastructure Projects in UTC / Sorrento Mesa Communities

Phase II: Infrastructure Improvements + BRT Mapping Development (1 of 10)

Index Number	Corridor	Project Name	Project Description	Project Status
	BRT	SuperLoop Rapid Bus	Rapid bus transit service in San Diego in University City. This project will provide local circulator service as an element of the Mid-Coast Corridor System. Routes 201, 202, and 204.	In close out, ends 8/30/2016
		Phase 1	Installation of 13 stations and roadway and signal improvements	Completed March 2013
1		Stations	Westfield UTC Transit Center	
2			Nobel Drive at Regents Road (East Bound)	
3			Nobel Drive at Lebon Drive (East and West Bound)	
4			Nobel Drive at La Jolla Village Square Driveway (East and West Bound)	
5			Villa La Jolla Drive at Gilman (East Bound)	
6			Gilman Drive at Villa La Jolla Drive (North Bound)	
7			Executive Drive at Regents Park Row (East and West Bound)	
8			Executive Drive at Executive Way (East Bound)	
9			Judicial Drive at Golden Haven Way (South Bound)	
10			Judicial Drive at Research Place (South Bound)	
11			Nobel Drive at Towne Center Drive (East Bound Station)	
12			Voigt Drive at Scripps Hospital (East and West Bound)	
13			Medical Center Drive at Health Sciences Drive (North and South Bound)	
		Phase 2	Construction of new stations and signals on the UCSD campus	Construction between April and September 2013
14		Station	Gilman Drive at Myers Drive (East and West Bound)	
		Phase 3	Additional stations in the La Jolla Colony area undergoing planning and preliminary engineering for possible future construction	Future
15		Stations	Nobel Drive and Shoreline Drive (West Bound)	
16			Regents Road and Nobel Drive (South Bound)	
17			Regents Road and Arriba Street (North Bound)	
18			Arriba Street and Regents Road (West Bound)	
19			Lebon Drive and Palmilla Drive (North Bound)	
20			Palmilla Drive and Lebon Drive (South Bound)	
21	BRT	Mira Mesa Blvd BRT Priority Treatments	BRT Priority Treatments on Mira Mesa Blvd between I-15 and Pacific Heights Blvd. Last two stops (UTC and UCSD Transit Station) are future Mid-Coast stops. Traditional transit priority improvements or 2-phase intersection design. Arterial improvement.	Draft Environmental Document release on 12/9/2013
22		Mira Mesa BRT HOV Access	Bus-only lane at Mira Mesa on ramp to I-805. Freeway improvement.	Construction ends 6/21/2014
	LRT	Mid-Coast Corridor Transit Project	The Mid-Coast Corridor Transit Project will extend San Diego light rail transit service from Santa Fe Depot to University City, serving major activity centers such as the University of California, San Diego and University Town Center.	Final Environmental Document ends 3/28/2014. Construction 2015-2018
23		Stations	Tecolote Road	
24			Clairemont Drive	
25			Balboa Avenue	
26			Nobel Drive	
27			V.A. Medical Center	
28			Pepper Canyon (UCSD West)	
29			Voigt Drive (UCSD East)	
30			Executive Drive	
31			Westfield UTC Transit Center	
	Heavy Rail	Sorrento Valley Double Track	Design double track from Mile Post (MP) 127.7 to MP 248.9, add additional parking (71 spaces net increase) and extend the existing platform at the Sorrento Valley Coaster Station. Second rail 1.1 miles to the north of Sorrento Valley Station. Raise track bed, replace wooden bridges.	Award Construction Contract ends 11/29/2013. Construction Winter 2013/2014-2015
	Heavy Rail	Sorrento to Miramar Double Track	Second main track in City of San Diego from MP 251 near the I-805 overcrossing to MP 253 near Miramar Road.	Phase 1 in construction, Phase 2 in EIR

Infrastructure Projects in UTC / Sorrento Mesa Communities

Phase II: Infrastructure Improvements + BRT Mapping Development (1 of 10)

Index Number	Corridor	Project Name	Project Description	Project Status
		Phase 1	1.1 miles of new track south of Sorrento Valley Blvd and east of 805. Replace wooden trestle bridge, new track crossover installed south of Sorrento Valley Blvd	Construction began June 2012 and should end by October 2013
		Phase 2	Add 2 miles of double tracking between 805 and Miramar Rd. and straighten sharp curves up Miramar hill	EIR in progress. Design finishes April 2015
	I-805	2 HOV Extension and Carroll Canyon DAR	Construction of I-805 from I-5 to Carroll Canyon Road including the extension of Carroll Canyon Road from Scranton Road to Sorrento Valley Road. Will include bus + HOV only lanes. Includes north-facing DAR at Carroll Canyon Road.	Construction ends 12/14/2013
32	I-805	I-805 North Segment 2 HOV Lanes (Design-Build Project)	Construct two HOV lanes in the median of I-805 between SR-52 and Mira Mesa Boulevard.	Construction ends 11/1/2015
33			Construct a south-facing DAR at Carroll Canyon Road.	
34	I-805	La Jolla Village Drive Interchange Improvements	Reconfigured the interchange at I-805/La Jolla Village Drive from a full cloverleaf to a partial cloverleaf design, and included bridge widening and ramp realignments. Route 919 has been re-routed to utilize the improvements.	Construction complete.
	I-805	North Segment 4 Express Lanes	I-805 Widening in San Diego from SR-52 to I-5 and merge in Sorrento Valley. Construct full interchange on I-805 at Nobel Drive	Final Environmental Document released 12/31/2010. Project is currently in Stage 1 construction.
35			DAR at Nobel Drive for HOV access	Post-2020 construction due to high competition.
36			Park & Ride lot in southwest corner of I-805 and Nobel Drive for carpooling and bus transfers from the proposed BRT facility	Post-2020 construction due to high competition.
37			Reconfigures Governor Drive interchange, relocate southbound entrance-ramp to northwest quadrant to minimize conflict with southbound I-805 traffic getting on SR-52 (2015-2020)	Post-2020 construction due to high competition.
38			Direct freeway-to-freeway HOV connector in the median from westbound SR-52 to northbound I-805.	Post-2020 construction due to high competition.
39			Direct freeway-to-freeway HOV connector in the median from southbound I-805 to eastbound SR-52.	Post-2020 construction due to high competition.
40	I-5	Genesee Interchange and Widening	On I-5 from Voigt Drive to Sorrento Valley Road, re-construction of Genesee over-crossing including interchange, ramps, retaining walls, and bicycle facility.	Award Construction Contract ends 9/1/2013
41	I-5	Voigt Drive DAR	Considered as part of the Locally Preferred Alternative of the I-5 North Coast Corridor. Project will provide direct access to Express Lanes on the I-5.	Programmed late as part of North Coast; North facing DAR will be constructed first.
	I-5	4 Express Lanes	Environmental clearance and advanced right-of-way acquisition for freeway widening on I-5 from La Jolla Village Drive to Vandergrift Boulevard.	Final Environmental Document ends 7/6/2014
	I-5	2 HOV Lomas to Manchester	Construction on I-5 in San Diego and Solana Beach from Sorrento Valley Boulevard to north of Lomas Santa Fe Avenue.	Construction done, close out done 12/20/2018
	I-5	2 HOV Manchester to SR 78	Widen I-5 from La Jolla Village Drive to Harbor Blvd.	Should be in Design, ROW acquisition until 2/12/2015. No earlier status updates
	I-5	Gilman Bridge Over I-5	Bridge crossing over I-5 north of La Jolla Village Drive bridge and south of Voigt Drive bridge. Bridge would tie into existing campus roads on both sides of the freeway.	Currently in preliminary design phase. Construction complete in Spring 2016.

Infrastructure Projects in UTC / Sorrento Mesa Communities

Phase II: Infrastructure Improvements + BRT Mapping Development (1 of 10)

Index Number	Corridor	Project Name	Project Description	Project Status
	I-5	Roselle / Sorrento Valley Boulevard Improvements	Alleviate traffic congestion and facilitate transit operations in the vicinity of Sorrento Valley Road, Sorrento Valley Boulevard, Vista Sorrento Parkway, and Roselle Street.	Currently reviewing alternatives and producing technical studies. Draft Environmental Document release on October 2014.
			Raise the rail line in order to grade-separate the current at-grade crossing at Sorrento Valley Boulevard	
			Intersection and roadway improvements to five intersections to accommodate future traffic volumes	
			Relocate Sorrento Valley Coaster Station to approximately one mile north of the existing Sorrento Valley Boulevard rail crossing	

San Diego
ASSOCIATION OF GOVERNMENTS

MEMO

3321001

SUBJECT: Memo on Operating Strategies

The goal of this study was to focus on existing and planned Bus Rapid Transit (BRT) services, in order to identify opportunities to coordinate transit service alignments and provide reliable and safe access to transit in the north Interstate 805 (I-805) corridor and Sorrento Valley project area. Some challenges for this area include pedestrian inaccessibility due to topography and suburban layouts, and parking constraints in the University of California, San Diego (UCSD) and University Town Center (UTC) areas.

The project team researched and summarized alternative operating strategies and best practices, particularly for serving office parks in other regions. In order to incorporate data from cities with similar commute patterns, the project team also did a literature review and interviewed agencies with successful last mile "best practices." The cities reviewed were the San Francisco Bay Area, Denver, and Minneapolis. Two types of best practices were analyzed: 1) those that improved the users mobility choices and 2) those that improved the usage of mobility options through outreach. The comprehensive list of best practices is summarized in Figure 1, and the BRT service strategies that the project team developed are outlined in Figure 2.

Figure 1: Last Mile "Best Practices" Table

Last Mile "Best Practices" Table

	Category	Picture	Features	Examples
MOBILITY CHOICES	Employer Shuttles		• Privately funded. Picks up employees from transit stations. • Shuttles are flexible and can accommodate trains that may be running behind schedule. • Consolidation is difficult. Companies must decide on cost-sharing, insurance liability, and potential route disruption. • Agencies are exploring internal programs to assist with route, stop planning, and public relations.	San Francisco/Bay Area Miami-Dade Transit Jersey City
	Car and Bike Share Programs		• Provides another option for trips away from the office during the day. • Bikes can be provided by the building or employer for local midday trips. • A car or van may be used to consolidate individual employee trips.	Boulder, CO MassDOT
	Call-N-Ride		• Call-N-Ride service available for designated regions around rail or rapid transit stops. • Generally a minimum 1-hour notice before scheduled trips. • There is no guaranteed same day service. • It is possible to schedule a recurring trip. • Can run on a fixed schedule during peak commute times • Frequencies between 15 and 60 minutes, with an average of 30 minutes.	Denver Shanghai Riverside
USER OUTREACH AND PERSONALIZED EXPERIENCE	Transit Concierge		• Friendly, personalized approach to transit for choice riders. • Employees fill out surveys detailing their schedule, commute, flexibility, and other characteristics of their work week. Representative provides transit plan for employee. • Free express bus to rail and rapid transit. • Guaranteed Ride Home service.	Bishop Ranch Office Park
	Financial Incentives		• Tax credits on dollars used to subsidize employee transit passes. • Participation program for employees who bike or walk and don't qualify for transit subsidies.	Nationwide
	Agency Promotion and Facilitation		• Provide staff at enrollment benefit fairs to promote and educate commuters. • Carpool matching services. • Vanpool matching and initiation provided by an employee of transit agency. • Transit agency liaison helps employers administer transit programs. • Awards for employers that strongly promote transit programs to employees.	SANDAG Minneapolis VTA (SC)

Three alternative operating strategies were developed:

1) **Trunk and Feeder:**
   Trunks are efficient and high capacity routes that connect regional nodes. This system creates more schedule efficiency for those travelling longer distances, because the bus is able to stay on a main road without going out of direction. Feeder routes connect those nodes to customer origin and destination points. The service will have stops in destination areas located on the main road, and provide opportunities for transit users to transfer to other services in order to get to their final destinations. A local example of this would be the Coaster Trunk line linked to the Coaster Connection feeder services.

2) **Nodal**
   Nodal (also known as Circular or Destination-Based) systems take customers to areas with high densities of development and accessibility. This system type connects users to destinations around the surrounding local area. A local example of this is the *SuperLoop* which connects the UCSD and UTC areas.

3) Multi-Modal

Multi-Modal (also known as first-mile/last-mile solutions) considers alternative transportation methods and establishes connections amongst all modes. Some examples of these Transportation Demand Management solutions include car-sharing, bike-sharing, employer shuttles, vanpools, carpools, and employee commute benefit programs.

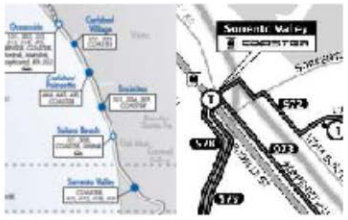
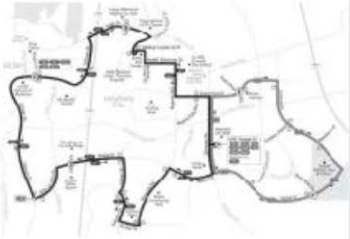
Figure 2: Alternative BRT Service Strategies

SANDAG *I-805 North UTC / Sorrento Valley Transit Study*

Alternative BRT Service Strategies Charrette

Project Background

The purpose of this study is to evaluate transportation options for the north I-805 corridor, UTC, and Sorrento Valley. The development of alternative BRT service strategies in the project area is fundamental to the evaluation of the transportation options. Each strategy will explored will have different implications on service coverage objectives, the role of BRT, station requirements, and opportunities/constraints associated with implementation. This charrette presents the opportunity to explore the features that fit under the three service strategies described below.

	Trunk and Feeder	Nodal / Circular / Destination-Based	Multi-Modal / Last Mile
			
Description	• Trunks are efficient and high capacity routes that connect regional nodes. • Feeder routes connect those nodes to customer origin and destination points.	• Destination-based transit system that takes customers to areas with high densities of development and accessibility (community nodes).	• Considers alternative transportation methods and establishes connections amongst all modes.
Examples	• Coaster (Trunk) and Coaster Connection (Feeder)	• SuperLoop	• Car-Sharing, Bike-Sharing, Employer Shuttles, Vanpools, Employee Commute Benefit Programs

A combination of these three alternative BRT service strategies was selected for this project to best serve the varying characteristics within the project area. The project team held a series of charrettes to evaluate and apply these different service strategies to the planned BRT routes and different communities within the project area.

3321001

SUBJECT: Memo on Station Needs for Each Alternative

Three alternative Bus Rapid Transit (BRT) Service Strategies were developed for serving the University Town Center (UTC)/Sorrento Mesa areas based on differing service coverage objectives: Trunk and Feeder, Nodal/Circular/Destination-Based, and Multi Modal.

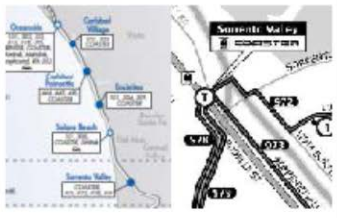
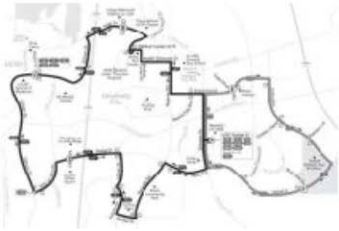
Figure 1: Alternative BRT Service Strategies

SANDAG *I-805 North UTC / Sorrento Valley Transit Study*

Alternative BRT Service Strategies Charrette

Project Background

The purpose of this study is to evaluate transportation options for the north I-805 corridor, UTC, and Sorrento Valley. The development of alternative BRT service strategies in the project area is fundamental to the evaluation of the transportation options. Each strategy will explored will have different implications on service coverage objectives, the role of BRT, station requirements, and opportunities/constraints associated with implementation. This charrette presents the opportunity to explore the features that fit under the three service strategies described below.

	Trunk and Feeder	Nodal / Circular / Destination-Based	Multi-Modal / Last Mile
			
Description	• Trunks are efficient and high capacity routes that connect regional nodes. • Feeder routes connect those nodes to customer origin and destination points.	• Destination-based transit system that takes customers to areas with high densities of development and accessibility (community nodes).	• Considers alternative transportation methods and establishes connections amongst all modes.
Examples	• Coaster (Trunk) and Coaster Connection (Feeder)	• SuperLoop	• Car-Sharing, Bike-Sharing, Employer Shuttles, Vanpools, Employee Commute Benefit Programs

Each of the proposed alternative BRT service strategies would create different types of station needs in order to enhance the first-mile/last-mile connections.

For the trunk and feeder system, trunks are efficient and high capacity routes that connect regional nodes. This system creates more efficiency for those travelling longer distances because the bus is able to stay on a main road without going out of direction. Feeder routes connect those nodes to customer origin and destination points. Since the trunk route does not directly serve origin and destination points, it creates the need for most passengers to transfer onto another service or mode, and therefore the nodes become major transfer centers. The stations that the trunk serve should have amenities to facilitate these major transfer centers (multiple bus bays with next bus signs) along with infrastructure to accommodate other types of first mile/last mile options (personal automobile parking, bicycle parking, and car sharing infrastructure). On the other hand the feeder routes will more directly serve origins and destinations, so station needs for the feeder routes should focus on bicycle and pedestrian access to these stations (sidewalks, signalized intersections with marked crosswalks, curb cuts, and bicycle lanes and paths).

For the nodal/circular/destination-based system, many origins and destinations are served directly by the route. This strategy is best for higher density mixed-use communities. Since origins and destinations are connected directly, passengers can often complete their trips without requiring a transfer. With a wide variety of trip generators (hospitals, educational institutions, employers), there will be demand for the services throughout the day including during off-peak hours. Because of the high volume of usage at the stations throughout the day, stations should have adequate amenities, including next bus signs, shelters, adequate lighting, larger passenger waiting areas and trash cans. Since many destinations are directly served, the stations do not need to accommodate for personal automobile parking, and instead, bicycle and pedestrian access to the stations should be improved.

For multi-modal/last-mile strategies, significant infrastructure is needed at stations with transfer activities. Bus bays to support employer shuttles, special parking for vanpools, and infrastructure for car and bike sharing is important to allow passengers many different options to reach their final destination. These types of improvements are most important in areas where destinations are spread out and difficult to serve with traditional transit strategies, such as the business parks in Sorrento Mesa.

A combination of these three alternative BRT service strategies was selected for this project to best serve the varying characteristics within the project area. The project team held a series of charrettes to evaluate and apply these different service strategies to the planned BRT routes and different communities within the project area. Therefore there will be a variety of different station needs to accommodate the varying strategies.

San Diego
ASSOCIATION OF GOVERNMENTS

MEMO

3321001

SUBJECT: Memo on Transit Priority Needs for Each Alternative

Three alternative Bus Rapid Transit (BRT) Service Strategies were developed for serving the University Town Center (UTC)/Sorrento Mesa areas based on differing service coverage objectives: Trunk and Feeder, Nodal/Circular/Destination-Based, and Multi Modal.

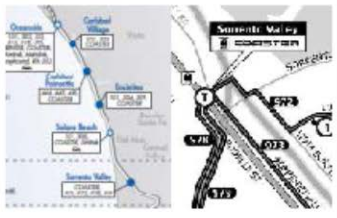
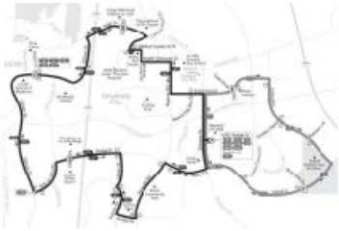
Figure 1: Alternative BRT Service Strategies

SANDAG *I-805 North UTC / Sorrento Valley Transit Study*

Alternative BRT Service Strategies Charrette

Project Background

The purpose of this study is to evaluate transportation options for the north I-805 corridor, UTC, and Sorrento Valley. The development of alternative BRT service strategies in the project area is fundamental to the evaluation of the transportation options. Each strategy will explored will have different implications on service coverage objectives, the role of BRT, station requirements, and opportunities/constraints associated with implementation. This charrette presents the opportunity to explore the features that fit under the three service strategies described below.

	Trunk and Feeder	Nodal / Circular / Destination-Based	Multi-Modal / Last Mile
			
Description	• Trunks are efficient and high capacity routes that connect regional nodes. • Feeder routes connect those nodes to customer origin and destination points.	• Destination-based transit system that takes customers to areas with high densities of development and accessibility (community nodes).	• Considers alternative transportation methods and establishes connections amongst all modes.
Examples	• Coaster (Trunk) and Coaster Connection (Feeder)	• SuperLoop	• Car-Sharing, Bike-Sharing, Employer Shuttles, Vanpools, Employee Commute Benefit Programs

Each of the proposed alternative BRT service strategies would create different types of transit priority needs.

For the trunk and feeder system, trunks are efficient and high capacity routes that connect regional nodes. This system creates more efficiency for those travelling longer distances because the bus is able to stay on a main road without going out of direction. Feeder routes connect those nodes to customer origin and destination points. Since the trunk route does not directly serve origin and destination points, it creates the need for most passengers to transfer, and therefore, the nodes become big transfer centers. Because the trunk and feeder system caters to commuters traveling long distances, it is of utmost importance that transfers are timed so that transit is a competitive alternative for them compared with driving a personal automobile. To accommodate these timed transfers, the on-time performance of the routes is critical. The trunk routes cover long distances, which creates more opportunities for the routes to fall behind schedule. Therefore, bus only lanes, utilizing high-occupancy lanes and direct access ramps should be considered. The feeder routes are much shorter and much more likely to encounter many signalized intersections, creating opportunities to fall behind schedule. Therefore, queue jumpers and signal priority at intersections should be considered to ensure the feeder routes are running on schedule.

For the nodal/circular/destination-based system, many origins and destinations are served directly by the route. This strategy is best for higher density mixed-use communities. Since origins and destinations are connected directly, passengers can often complete their trips without requiring a transfer. Because transfers are not required for a lot of trips, on-time performance is not as critical; however, for transit to be a competitive mode, reliability is always a factor. Since destination-based systems service higher density areas, they are likely to encounter many signalized intersections, creating opportunities to fall behind schedule. Therefore, queue jumpers and signal priority at intersections should be considered to ensure the destination-based routes are running on schedule.

The multi-modal/last-mile strategy incorporates modes other than traditional transit. Therefore, transit priority measures are not appropriate to accommodate this strategy.

A combination of these three alternative BRT service strategies was selected for this project to best serve the varying characteristics within the project area. The project team held a series of charrettes to evaluate and apply these different service strategies to the planned BRT routes and different communities within the project area. Therefore, there will be a variety of different transit priority measures needed to accommodate the varying strategies.

San Diego
ASSOCIATION OF GOVERNMENTS

MEMO

3321001

SUBJECT: Memo on Pedestrian Access Needs for Each Alternative

Three alternative Bus Rapid Transit (BRT) Service Strategies were developed for serving the University Town Center (UTC)/Sorrento Mesa areas based on differing service coverage objectives: Trunk and Feeder, Nodal/Circular/Destination-Based, and Multi Modal.

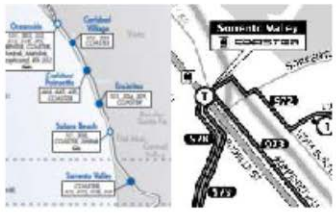
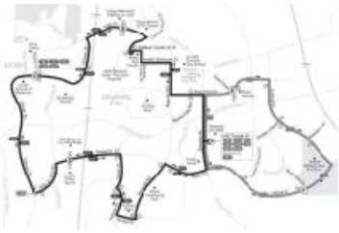
Figure 1: Alternative BRT Service Strategies

SANDAG — *I-805 North UTC / Sorrento Valley Transit Study*

Alternative BRT Service Strategies Charrette

Project Background

The purpose of this study is to evaluate transportation options for the north I-805 corridor, UTC, and Sorrento Valley. The development of alternative BRT service strategies in the project area is fundamental to the evaluation of the transportation options. Each strategy will explored will have different implications on service coverage objectives, the role of BRT, station requirements, and opportunities/constraints associated with implementation. This charrette presents the opportunity to explore the features that fit under the three service strategies described below.

	Trunk and Feeder	Nodal / Circular / Destination-Based	Multi-Modal / Last Mile
			
Description	• Trunks are efficient and high capacity routes that connect regional nodes. • Feeder routes connect those nodes to customer origin and destination points.	• Destination-based transit system that takes customers to areas with high densities of development and accessibility (community nodes).	• Considers alternative transportation methods and establishes connections amongst all modes.
Examples	• Coaster (Trunk) and Coaster Connection (Feeder)	• SuperLoop	• Car-Sharing, Bike-Sharing, Employer Shuttles, Vanpools, Employee Commute Benefit Programs

Each of the proposed alternative BRT service strategies would create different types of pedestrian access needs.

For the trunk and feeder system, trunks are efficient and high capacity routes that connect regional nodes. This system creates more efficiency for those travelling longer distances because the bus is able to stay on a main road without going out of direction. Feeder routes connect those nodes to customer origin and destination points. Since the trunk route does not directly serve origin and destination points, it creates the need for most passengers to transfers and therefore the nodes become big transfer centers. The stations that the trunk serve may or may not directly serve origin and destination points. For example, in the project area, trunk routes will serve the Nobel Park & Ride lot. Since the Nobel Park & Ride lot is not at a location that would serve origins and destinations via a pedestrian connection, pedestrian improvements for accessing the station are not as important. However, there are many origin and destinations just outside a half-mile walking buffer of the Nobel Park & Ride lot, therefore bicycle access improvements such as bike paths and lanes would be a good investment. Another station that trunk routes will serve in the project area is Westfield UTC. There are many trip generating origins and destinations accessible both within and outside of a half-mile walking buffer. Therefore, both pedestrian (sidewalks, signalized intersections with marked crosswalks, curb cuts) and bicycle improvements are important for accessing the station.

For the nodal/circular/destination-based system, many origins and destinations are served directly by the route. This strategy is best for higher density mixed-use communities. Since origins and destinations are connected directly, passengers can often complete their trips without requiring a transfer. Since many destinations are directly served, the stations do not need to accommodate for personal automobile parking, instead bicycle and pedestrian access to the stations should be improved.

The multi-modal/last-mile strategy serves as an alternative to bicycling and walking. Therefore, at stations where multi-modal strategies are incorporated, other access improvements are less important.

A combination of these three alternative BRT service strategies was selected for this project to best serve the varying characteristics within the project area. The project team held a series of charrettes to evaluate and apply these different service strategies to the planned BRT routes and different communities within the project area. Therefore, there will be a variety of different bicycle and pedestrian access needs to accommodate the varying strategies.

San Diego
ASSOCIATION OF GOVERNMENTS

MEMO

3321001

SUBJECT: Memo on Capital and Operating Costs

Three alternative Bus Rapid Transit (BRT) Service Strategies were developed for serving the University Town Center (UTC)/Sorrento Mesa areas based on differing service coverage objectives: Trunk and Feeder, Nodal/Circular/Destination-Based, and Multi Modal.

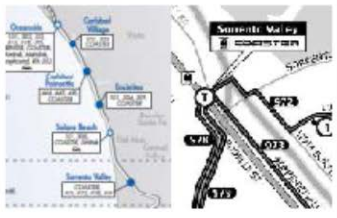
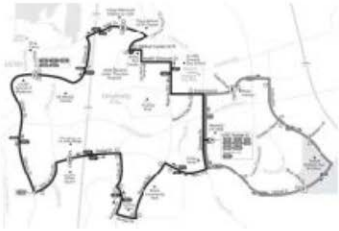
Figure 1: Alternative BRT Service Strategies

SANDAG — *I-805 North UTC / Sorrento Valley Transit Study*

Alternative BRT Service Strategies Charrette

Project Background

The purpose of this study is to evaluate transportation options for the north I-805 corridor, UTC, and Sorrento Valley. The development of alternative BRT service strategies in the project area is fundamental to the evaluation of the transportation options. Each strategy will explored will have different implications on service coverage objectives, the role of BRT, station requirements, and opportunities/constraints associated with implementation. This charrette presents the opportunity to explore the features that fit under the three service strategies described below.

	Trunk and Feeder	Nodal / Circular / Destination-Based	Multi-Modal / Last Mile
			
Description	• Trunks are efficient and high capacity routes that connect regional nodes. • Feeder routes connect those nodes to customer origin and destination points.	• Destination-based transit system that takes customers to areas with high densities of development and accessibility (community nodes).	• Considers alternative transportation methods and establishes connections amongst all modes.
Examples	• Coaster (Trunk) and Coaster Connection (Feeder)	• SuperLoop	• Car-Sharing, Bike-Sharing, Employer Shuttles, Vanpools, Employee Commute Benefit Programs

Each of the proposed alternative BRT service strategies impacts capital and operating costs differently.

At this phase of the project, the operating strategies were not used to define specific alignments making it impossible to develop rough estimate for capital and operating costs. However, this memo will include a discussion on how each of the strategies can impact operating and capital costs.

The trunk and feeder operating strategy is ideal for serving long distance commuters. The associated operating costs for the trunk routes are high because of the long distances they cover. Trunk routes should have a long span of service with high frequency during the peak, further increasing the operating costs. However, since operating costs are typically calculated per hour, the average time per trip for trunk routes will be low considering the distance travel due to high average speed of vehicles as they take advantage of high speed facilities (High-Occupancy-Vehicle lanes). Because of the facilities used by vehicles traveling trunk routes, Direct Access Ramps and other freeway related capital improvement projects are very high cost. The feeder routes are relatively low cost to operate. Capital improvements are not recommended specifically for feeder routes, allowing them greater flexibility to change alignments. The operating cost of an individual feeder route is relatively low; however, to ensure success of the system, many feeder routes are required to provide superior access to the trunk route.

The nodal operating strategy connects many destinations through areas that have high densities. Because of the types of areas served by the nodal operating strategies, these services are likely to operate on arterials, encountering many traffic signals. Therefore, the total cycle time for vehicles serving these routes can be high considering the distance covered. Overall the cycle time for a vehicle running a nodal route is not nearly as high as a trunk route, and because the nodal route serves high density and other residential trip generating destinations directly feeder routes are not required. And because of the high density, many individuals will be served resulting in a low operating cost per passenger. Capital costs are also lower, considering capital improvements such as queue jumpers and transit signal priority are appropriate for nodal routes.

The multi-modal strategy includes connecting all modes with last mile strategies such as car and bike sharing and employer shuttles. The operating costs of these strategies are typically bore by the user. While there are capital costs required to ensure the success of these strategies, typically they will be covered by the private company providing the service. It does require close coordination with the private company since success depends on seamless transfers between these last mile strategies and traditional transit modes, meaning bicycle or car sharing parking and shuttle stops must be incorporated into transit stations.

A combination of these three alternative BRT service strategies was selected for this project to best serve the varying characteristics within the project area. The project team held a series of charrettes to evaluate and apply these different service strategies to the planned BRT routes and different communities within the project area.

San Diego
ASSOCIATION OF GOVERNMENTS

MEMO

3321001

SUBJECT: Memo on Initial Evaluation Results

Three alternative Bus Rapid Transit (BRT) Service Strategies were developed for serving the University Town Center (UTC)/Sorrento Mesa areas based on differing service coverage objectives: Trunk and Feeder, Nodal/Circular/Destination-Based, and Multi Modal.

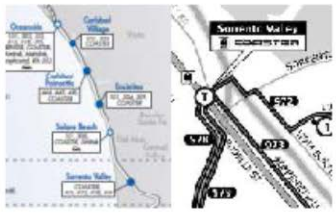
Figure 1: Alternative BRT Service Strategies

SANDAG — *I-805 North UTC / Sorrento Valley Transit Study*

Alternative BRT Service Strategies Charrette

Project Background

The purpose of this study is to evaluate transportation options for the north I-805 corridor, UTC, and Sorrento Valley. The development of alternative BRT service strategies in the project area is fundamental to the evaluation of the transportation options. Each strategy will explored will have different implications on service coverage objectives, the role of BRT, station requirements, and opportunities/constraints associated with implementation. This charrette presents the opportunity to explore the features that fit under the three service strategies described below.

	Trunk and Feeder	Nodal / Circular / Destination-Based	Multi-Modal / Last Mile
			
Description	• Trunks are efficient and high capacity routes that connect regional nodes. • Feeder routes connect those nodes to customer origin and destination points.	• Destination-based transit system that takes customers to areas with high densities of development and accessibility (community nodes).	• Considers alternative transportation methods and establishes connections amongst all modes.
Examples	• Coaster (Trunk) and Coaster Connection (Feeder)	• SuperLoop	• Car-Sharing, Bike-Sharing, Employer Shuttles, Vanpools, Employee Commute Benefit Programs

On August 29, 2013, the project team held a charrette to evaluate each operating strategy. Given the diverse characteristics within the project area, a combination of the three alternative BRT service strategies was selected for this project.

Five of the routes included in 2050 Regional Transportation Plan serving the project area were identified as a trunk and feeder strategy: Routes 680, 470, 688, 689, and 870. Based on the previous assessment of the trunk and feeder strategy, a list of recommendations was developed for each route to maximize their effectiveness.

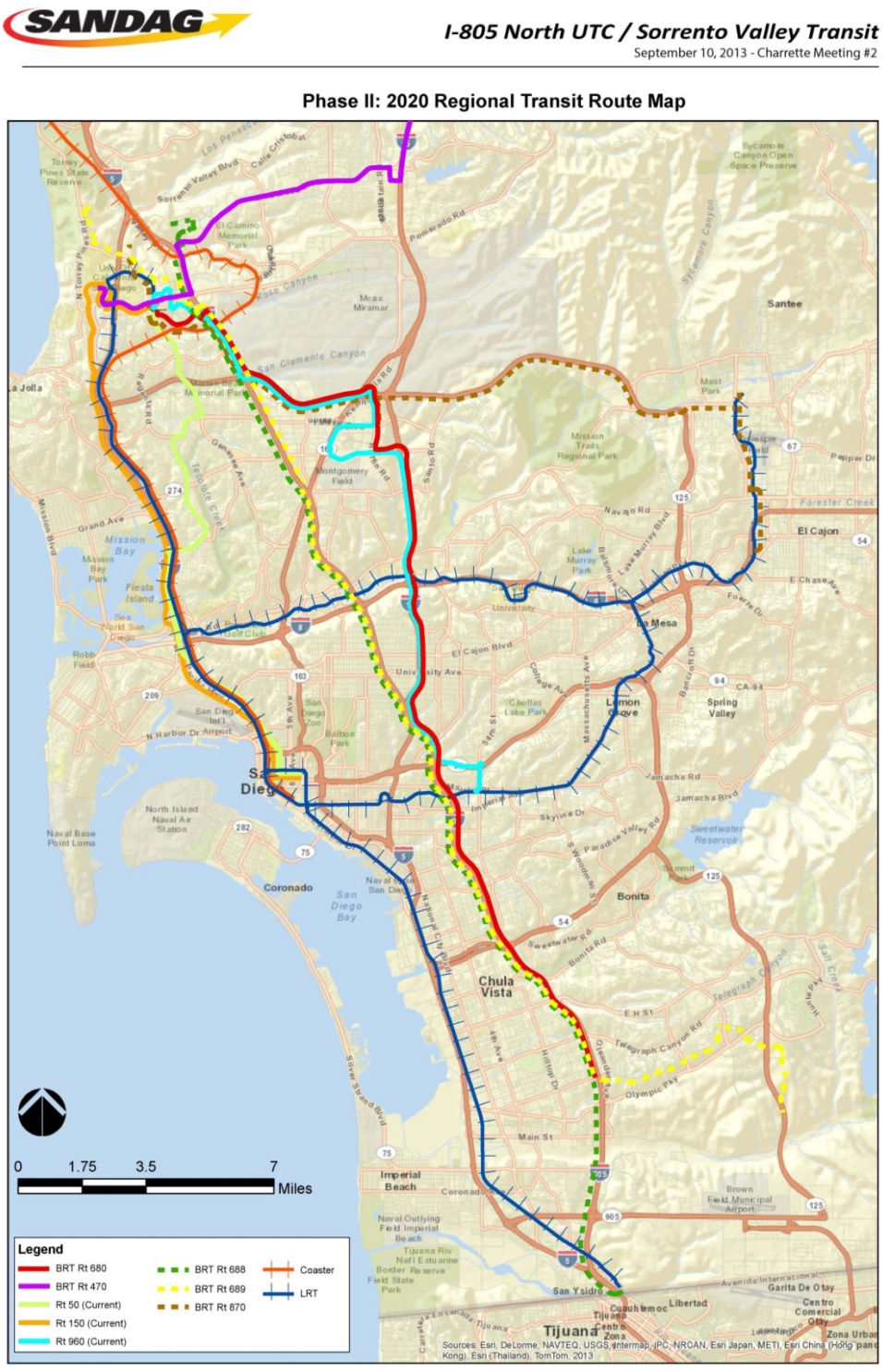
- Route 680
    1. Only serve Sorrento Valley during the peak
    2. Serve UTC
    3. Serve University of San Diego, California (UCSD)
    4. Truncate route in the south at Palomar
- Route 470
    1. Serve UCSD
    2. Provide all-day service
    3. Mira Mesa as branded trunk
- Route 688
    1. Create deviation off Nobel Drive to connect with Routes 689 and 870
- Route 689
    1. Serve UCSD
    2. Evaluate transfer points for Routes 688 and 689
    3. Access North Torrey Pines via Eastgate and Judicial
- Route 870
    1. Connect to UTC (regional hub)

The existing *SuperLoop* service is the only nodal service currently existing or planned for the area. It acts as an anchor in the UTC area, connecting all the major trip generators in the area and also with all the trunk routes at Westfield UTC. The project team discussed a new Sorrento Valley circular service through Barnes Canyon Road and Scranton Road, based on the inability of the trunk and feeder routes above to effectively serve the low to moderate density office parks of Sorrento Valley.

Finally, the project team discussed the multi-modal strategy, and the benefits to bundling the existing employer shuttles in Sorrento Valley and the expansion of the Guaranteed Ride Home Program.

Moving forward, the project team will continue to meet to refine the alignments of the proposed network serving the project area. To be able to most effectively analyze these recommendations, they were reflected in a regional map. To fully understand the network, some key local routes were incorporated into the regional map, including Routes 50, 150, and 960.

Figure 2: Initial Evaluation Results Regional Map



Finally, to ensure adequate analysis as the strategy was further evaluated and refined, Kimley Horn developed two Transfer Opportunity Matrices with start and end points (for peak and off-peak) and a Transit Infrastructure Utilization Table.

Figure 3: Peak Period Transfer Opportunity Matrix

2020 Path Choice Matrix Peak Period System
Phase II: Infrastructure Improvements + BRT Mapping Development (4 of 10)

ORIGIN	DESTINATION: (1) Qualcomm Headquarters	(2) Green Flash Brewery/ West Sorrento Mesa	(3) Qualcomm North of Lusk	(4) UTC	(5) UCSD West/ Veteran's Medical Center	(6) North Campus Point Drive	(7) Scripps Green Hospital	(8) Executive Drive
(A) Palomar DAR	680 --> 470 689--> 470	680 --> 470 689--> 470	680--> 688 689 --> 688	680	680 --> 470 680 --> Mid-Coast 680--> Superloop	680 --> 870 680 --> 870 689 --> 870	689	680--> Superloop 680 --> Mid-Coast
(B) I-15/El Cajon	680-->470 960--> 470	680-->470 960--> 470	680-->688 960--> 688	680	680--> Mid-Coast 680--> Superloop 680-->Superloop	680--> 870	680--> 689	680--> Superloop 680 --> Mid-Coast
(C) Santee Town Center	870--> 688 870--> 470	870--> 470	870--> 688	870	870--> 470 870--> Mid-Coast 870-->Superloop	870	870--> 689	870
(D) San Ysidro	688	688--> 470	688	688 --> 680 688--> Superloop	688--> Superloop	688--> 870	688--> 689	688--> Superloop 688--> 870
(E) Mira Mesa Transit Center	470	470	470--> 688	470	470	470--> 870	470--> 689	470
(F) Solana Beach Coaster Station	Coaster--> Coaster Connection	Coaster --> Coaster Connection --> 470	Coaster--> Coaster Connection	Coaster --> Coaster Connection	Coaster --> Coaster Connection --> Superloop	Coaster --> Coaster Connection --> 870	Coaster --> Coaster Connection	Coaster --> Coaster Connection
(G) Otay Ranch Town Center	689--> 470	689--> 470	689--> 688	689--> Superloop 689--> 680	689--> Superloop 689--> 470	689--> 870	689	689--> Superloop

Transfer Legend

No Transfer	
UTC	
Nobel Drive	

Priority Legend

Tier One	No Transfer	
Tier Two	One Transfer	All Day Transfer to BRT/LRT
		BRT to Express Service (Peak Hour)
Tier Three	Two Plus Transfers	

Figure 4: Off-Peak Transfer Opportunity Matrix

2020 Path Choice Matrix Off-Peak System
Phase II: Infrastructure Improvements + BRT Mapping Development (4 of 10)

ORIGIN	DESTINATION: (1) Qualcomm Headquarters	(2) Green Flash Brewery/ West Sorrento Mesa	(3) Qualcomm North of Lusk	(4) UTC	(5) UCSD West/ Veteran's Medical Center	(6) North Campus Point Drive	(7) Scripps Green Hospital	(8) Executive Drive
(A) Palomar DAR	680 --> 470	680 --> 470	N/A	680	680 --> Superloop 680 --> Mid-Coast 680--> 470	N/A	N/A	680 --> Superloop 680 --> Mid-Coast
(B) I-15/El Cajon	680--> 470	680--> 470	N/A	680	680--> Superloop 680-->Superloop 680--> Mid-Coast	N/A	N/A	680
(C) Santee Town Center	Green Line--> Mid-Coast --> 470	Green Line--> Mid-Coast --> 470	N/A	Green Line--> Mid-Coast	Green Line--> Mid-Coast	N/A	N/A	Green Line--> Mid-Coast
(D) San Ysidro	Blue Line --> Mid-Coast --> 470	Blue Line --> Mid-Coast --> 470	N/A	Blue Line --> Mid-Coast	Blue Line --> Mid-Coast	N/A	N/A	Blue Line --> Mid-Coast --> Superloop
(E) Mira Mesa Transit Center	470	470	N/A	470	470	N/A	N/A	470
(F) Solana Beach Coaster Station	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
(G) Otay Ranch Town Center	South Bay BRT--> 680 --> 470	South Bay BRT--> 680 --> 470	N/A	South Bay BRT--> 680	South Bay BRT--> 680 --> Mid-Coast	N/A	N/A	South Bay BRT--> 680 --> Mid-Coast

Transfer Legend

No Transfer	
UTC	
Nobel Drive	

Priority Legend

Tier One	No Transfer	
Tier Two	One Transfer	All Day Transfer to BRT/LRT
		BRT to Express Service (Peak Hour)
Tier Three	Two Plus Transfers	

Figure 5: Transit Infrastructure Utilization Table

2020 Transit Infrastructure Utilization Table
Phase II: Infrastructure Improvements + BRT Mapping Development (3 of 10)

			BRT Route					Superloop		
			470	680	688	689	870	201	202	204
SuperLoop	1	UTC Transit Center	✓	✓			✓	✓	✓	✓
	2	Nobel Drive at Regents Road							✓	
	3	Nobel Drive at Lebon Drive						✓	✓	
	4	Nobel Drive at La Jolla Village Square Driveway						✓	✓	
	5	Villa La Jolla Drive at Gilman						✓		
	6	Gimlan Drive at Villa La Jolla Drive							✓	
	7	Executive Drive at Regents Park Row					✓	✓	✓	
	8	Executive Drive at Executive Way								✓
	9	Judicial Drive at Golden Haven Way				✓				✓
	10	Judicial Drive at Research Place				✓				✓
	11	Nobel Drive at Towne Center Drive		✓			✓			✓
	12	Voigt Drive at Scripps Hospital							✓	
	13	Medical Center Drive at Health Sciences Drive						✓		
	14	Gilman Drive at Myers Drive	✓					✓	✓	
	15	Nobel Drive and Shoreline Drive		✓						✓
	16	Regents Road and Nobel Drive							✓	
	17	Regents Road and Arriba Street						✓		
	18	Arriba Street and Regents Road							✓	
	19	Lebon Drive and Palmilla Drive							✓	
	20	Palmilla Drive and Lebon Drive						✓		

2020 Transit Infrastructure Utilization Table

Phase II: Infrastructure Improvements + BRT Mapping Development (3 of 10)

			BRT Route					Superloop		
			470	680	688	689	870	201	202	204
Mira Mesa BRT	21	Mira Mesa BRT Treatments	✓							
	22	Mira Mesa BRT HOV Access Lane	✓							
Mid-Coast Stations	26	Nobel Drive						✓	✓	
	27	V.A. Medical Center	✓							
	28	UCSD West								
	29	UCSD East							✓	
	30	Executive Drive					✓	✓	✓	✓
	31	UTC Transit Center	✓	✓			✓	✓	✓	✓
I-805 HOV	32	HOV Lanes from SR-52 to Mira Mesa Boulevard	✓		✓	✓	✓			
	33	Carroll Canyon HOV DAR			✓					
La Jolla Village Drive Interchange Improvements	34	Reconfigured Interchange at La Jolla Village Drive and I-805	✓							
North Segment 4 Express Lanes	35	DAR at Nobel Drive and I-805		✓	✓	✓	✓			
	36	Park & Ride lot in southwest corner of I-805 and Nobel Drive		✓	✓	✓	✓			
	37	Reconfigure Governor Drive and I-805 interchange		✓	✓	✓	✓			
	38	Direct HOV connector between W SR-52 to N I-805		✓			✓			
	39	Direct HOV connector between S I-805 to E SR-52		✓			✓			
Genesee	40	Genesee Avenue Interchange				✓				
Voigt Drive DAR	41	HOV DAR at Voigt Drive						✓	✓	

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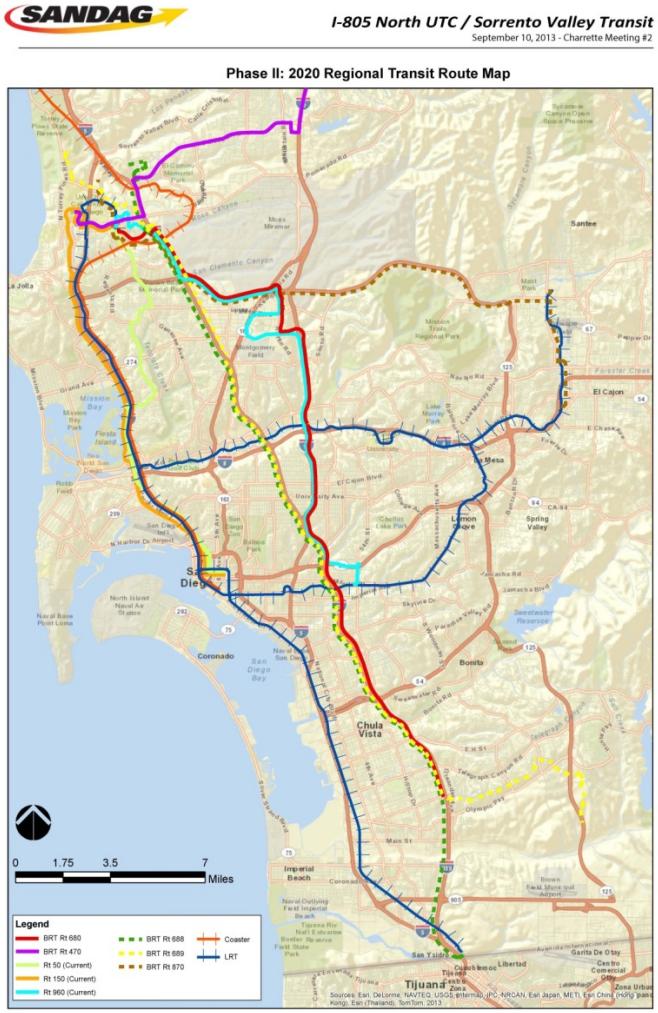
SUBJECT: Memo Summarizing Stakeholder Group Input and Response on Incorporating them into Task 3.1 Evaluation

Project Team Charrette #2

On August 29, 2013, the project team held a charrette to evaluate operating strategies and implementing them into a network serving the project area. Figure 1 is a regional map showing the results of this charrette.

Figure 1: Initial Evaluation Results Regional Map



To facilitate further evaluation and refining, Kimley Horn developed two Transfer Opportunity Matrices with start and end points (for peak and off-peak) and a Transit Infrastructure Utilization Table. These were analyzed at a second charrette which gave stakeholders and additional opportunity for input.

Figure 2: Peak-Period Transfer Opportunity Matrix

2020 Path Choice Matrix Peak Period System
Phase II: Infrastructure Improvements + BRT Mapping Development (4 of 10)

ORIGIN	DESTINATION: (1) Qualcomm Headquarters	(2) Green Flash Brewery/ West Sorrento Mesa	(3) Qualcomm North of Lusk	(4) UTC	(5) UCSD West/ Veteran's Medical Center	(6) North Campus Point Drive	(7) Scripps Green Hospital	(8) Executive Drive
(A) Palomar DAR	680 --> 470 689--> 470	680 --> 470 689--> 470	680--> 688 689 --> 688	680	680 --> 470 680 --> Mid-Coast 680--> Superloop	680 --> 870 680 --> 870 689 --> 870	689	680--> Superloop 680 --> Mid-Coast
(B) I-15/El Cajon	680-->470 960--> 470	680-->470 960--> 470	680-->688 960--> 688	680	680--> Mid-Coast 680--> Superloop 680-->Superloop	680--> 870	680--> 689	680--> Superloop 680 --> Mid-Coast
(C) Santee Town Center	870--> 688 870--> 470	870--> 470	870--> 688	870	870--> 470 870--> Mid-Coast 870-->Superloop	870	870--> 689	870
(D) San Ysidro	688	688--> 470	688	688 --> 680 688--> Superloop	688--> Superloop	688--> 870	688--> 689	688--> Superloop 688--> 870
(E) Mira Mesa Transit Center	470	470	470--> 688	470	470	470--> 870	470--> 689	470
(F) Solana Beach Coaster Station	Coaster--> Coaster Connection	Coaster --> Coaster Connection --> 470	Coaster--> Coaster Connection	Coaster --> Coaster Connection	Coaster --> Coaster Connection --> Superloop	Coaster --> Coaster Connection --> 870	Coaster --> Coaster Connection	Coaster --> Coaster Connection
(G) Otay Ranch Town Center	689--> 470	689--> 470	689--> 688	689--> Superloop 689--> 680	689--> Superloop 689--> 470	689--> 870	689	689--> Superloop

Transfer Legend

No Transfer	
UTC	
Nobel Drive	

Priority Legend

Tier One	No Transfer	
Tier Two	One Transfer	All Day Transfer to BRT/LRT
		BRT to Express Service (Peak Hour)
Tier Three	Two Plus Transfers	

Figure 3: Off-Peak Transfer Opportunity Matrix

2020 Path Choice Matrix Off-Peak System
Phase II: Infrastructure Improvements + BRT Mapping Development (4 of 10)

ORIGIN	DESTINATION: (1) Qualcomm Headquarters	(2) Green Flash Brewery/ West Sorrento Mesa	(3) Qualcomm North of Lusk	(4) UTC	(5) UCSD West/ Veteran's Medical Center	(6) North Campus Point Drive	(7) Scripps Green Hospital	(8) Executive Drive
(A) Palomar DAR	680 --> 470	680 --> 470	N/A	680	680 --> Superloop 680 --> Mid-Coast 680--> 470	N/A	N/A	680 --> Superloop 680 --> Mid-Coast
(B) I-15/El Cajon	680--> 470	680--> 470	N/A	680	680--> Superloop 680-->Superloop 680--> Mid-Coast	N/A	N/A	680
(C) Santee Town Center	Green Line--> Mid-Coast --> 470	Green Line--> Mid-Coast --> 470	N/A	Green Line--> Mid-Coast	Green Line--> Mid-Coast	N/A	N/A	Green Line--> Mid-Coast
(D) San Ysidro	Blue Line --> Mid-Coast --> 470	Blue Line --> Mid-Coast --> 470	N/A	Blue Line --> Mid-Coast	Blue Line --> Mid-Coast	N/A	N/A	Blue Line --> Mid-Coast --> Superloop
(E) Mira Mesa Transit Center	470	470	N/A	470	470	N/A	N/A	470
(F) Solana Beach Coaster Station	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
(G) Otay Ranch Town Center	South Bay BRT--> 680 --> 470	South Bay BRT--> 680 --> 470	N/A	South Bay BRT--> 680	South Bay BRT--> 680 --> Mid-Coast	N/A	N/A	South Bay BRT--> 680 --> Mid-Coast

Transfer Legend

No Transfer	
UTC	
Nobel Drive	

Priority Legend

Tier One	No Transfer	
Tier Two	One Transfer	All Day Transfer to BRT/LRT
		BRT to Express Service (Peak Hour)
Tier Three	Two Plus Transfers	

Figure 4: Transit Infrastructure Utilization Table

2020 Transit Infrastructure Utilization Table
Phase II: Infrastructure Improvements + BRT Mapping Development (3 of 10)

			BRT Route					Superloop		
			470	680	688	689	870	201	202	204
SuperLoop	1	UTC Transit Center	✓	✓			✓	✓	✓	✓
	2	Nobel Drive at Regents Road							✓	
	3	Nobel Drive at Lebon Drive						✓	✓	
	4	Nobel Drive at La Jolla Village Square Driveway						✓	✓	
	5	Villa La Jolla Drive at Gilman						✓		
	6	Gimlan Drive at Villa La Jolla Drive							✓	
	7	Executive Drive at Regents Park Row					✓	✓	✓	
	8	Executive Drive at Executive Way								✓
	9	Judicial Drive at Golden Haven Way				✓				✓
	10	Judicial Drive at Research Place				✓				✓
	11	Nobel Drive at Towne Center Drive		✓			✓			✓
	12	Voigt Drive at Scripps Hospital							✓	
	13	Medical Center Drive at Health Sciences Drive						✓		
	14	Gilman Drive at Myers Drive	✓					✓	✓	
	15	Nobel Drive and Shoreline Drive		✓						✓
	16	Regents Road and Nobel Drive							✓	
	17	Regents Road and Arriba Street						✓		
	18	Arriba Street and Regents Road							✓	
	19	Lebon Drive and Palmilla Drive							✓	
	20	Palmilla Drive and Lebon Drive						✓		

2020 Transit Infrastructure Utilization Table

Phase II: Infrastructure Improvements + BRT Mapping Development (3 of 10)

			BRT Route					Superloop		
			470	680	688	689	870	201	202	204
Mira Mesa BRT	21	Mira Mesa BRT Treatments	✓							
	22	Mira Mesa BRT HOV Access Lane	✓							
Mid-Coast Stations	26	Nobel Drive						✓	✓	
	27	V.A. Medical Center	✓							
	28	UCSD West								
	29	UCSD East							✓	
	30	Executive Drive					✓	✓	✓	✓
	31	UTC Transit Center	✓	✓			✓	✓	✓	✓
I-805 HOV	32	HOV Lanes from SR-52 to Mira Mesa Boulevard	✓		✓	✓	✓			
	33	Carroll Canyon HOV DAR			✓					
La Jolla Village Drive Interchange Improvements	34	Reconfigured Interchange at La Jolla Village Drive and I-805	✓							
North Segment 4 Express Lanes	35	DAR at Nobel Drive and I-805		✓	✓	✓	✓			
	36	Park & Ride lot in southwest corner of I-805 and Nobel Drive		✓	✓	✓	✓			
	37	Reconfigure Governor Drive and I-805 interchange		✓	✓	✓	✓			
	38	Direct HOV connector between W SR-52 to N I-805		✓			✓			
	39	Direct HOV connector between S I-805 to E SR-52		✓			✓			
Genesee	40	Genesee Avenue Interchange				✓				
Voigt Drive DAR	41	HOV DAR at Voigt Drive						✓	✓	

The project team held the second charrette on September 10, 2013. The first charrette had focused on developing trunk and feeder strategies with two main achievements:

- Creating a strong all-day network in the project area by developing Routes 680 and 470.
- Establishing the Nobel Drive transit station and Westfield University Town Center as the two main transfer hubs for the peak-period only express routes.

At the second charrette, the opportunity matrices and infrastructure utilization table in Figures 2 through 4 were used to analyze the effectiveness of the network developed in the first charrette. Through the analysis of the opportunity matrices, the project team determined that the peak-period system has a majority of origin-destinations being served by a "one seat ride" or one transfer. However, the off-peak period system has major gaps in serving key destinations:

- Sorrento Valley COASTER Station
- Qualcomm/North of Lusk
- North Campus Point Drive
- Scripps Green Hospital
-

Several of these trips require two transfers during the off-peak period. This was of particular concern for the hospitals, whose staff schedules typically do not align with traditional peak-period service.

The project team proposed using the Nodal/Circular operating strategies in the form of two new routes to fill these service gaps:

1) Sorrento Valley Shuttle System
    - Circular, all-day system
    - Service through Barnes Canyon Road and Scranton Road
    - Possibly build off of Qualcomm's existing shuttle system
    - Gaps in this area may also be served by Route 921 with Route 470 as an all-day service

2) University of San Diego, California (UCSD) West/North Torrey Pines Shuttle System
    - Tailor to hospitals early peak-periods (5:30 a.m. and 3:30 p.m.) when many hospital staff have a shift change
    - Serve Scripps Memorial Hospital La Jolla, Scripps Green Hospital, and possibly the VA Medical Center
    - Route 101 may become a Bus Rapid Transit (BRT) route in the future; however, there may be a span of service issue for hospitals

The project team also discussed improving connections to the COASTER, which does not connect with the regional network included in the 2050 Regional Transportation Plan (RTP) or the refinements developed through the first project team charrette. The project team recommended analyzing a possible COASTER station extension for BRT Route 688. The connection to the COASTER station would create additional deadhead, and therefore increase costs. To balance this, the project team recommended considering the COASTER station connection only on buses where the service would match up with the arrival times of COASTER trains at the station.

Planning Group and UCSD Input

SANDAG staff attended Community Group meetings for University Community Planning Group, Mira Mesa Town Council and the Torrey Pines Community Planning Board to solicit feedback. SANDAG staff also unsuccessfully attempted to engage the Mira Mesa Community Planning Group. SANDAG presented at the University Community Planning Group on June 11, 2013, and the Torrey Pines Community Planning Group on May 9, 2013, to give an introductory briefing and gather general comments from residents and planning group members. At the University Community Planning Group, a resident requested reinstatement of bus service on Governor Drive and a planning board member expressed concern over the Nobel Drive Direct Access Ramp Park & Ride and transit station location due to sensitive lands in the area and the locations distance from residential areas and trip generating destinations. The Torrey Pines Community Planning Group requested transit service along Del Mar Heights Road and expressed concern about the lack of transit planned to serve the proposed One Paseo development.

Finally, SANDAG staff also met with Robert Holden (UCSD Auxiliary Business Services) on May 2, 2013. Much of the discussion focused on UCSD's interest in reducing their provision of shuttle services to provide students, faculty, and staff with access to campus. Mr. Holden cited issues with impacted parking in neighborhoods due to individuals accessing the UCSD shuttle routes that do not live nearby and suggested this concern was in part created by the UCSD transit passes only being valid on the routes that directly serve campus and the length of time it takes to access campus using local routes, particularly Route 30 and Route 101. Mr. Holden also expressed a concern with the lack of a transit connection between the Sorrento Valley COASTER station and campus.

In October, 2013 SANDAG again met with each of the stakeholder and stakeholder groups to share the results of the evaluation and additionally met with the Mira Mesa Town Council and Council Pro Tem Sherri Lightner.

Incorporating Stakeholder Group Input

Stakeholder input was solicited both through the project team meetings and the meetings with planning groups and UCSD. Many of the comments received at planning group meetings were not applicable to the project area and routes included in the 2050 RTP. Two comments received from UCSD and the University Community Planning Group that were considered were:

1) The lack of transit connection between the Sorrento Valley COASTER station and UCSD campus. As mentioned above, at the second charrette the project discussed extended Route 688 to the COASTER station. This would provide a connection between the COASTER station and UCSD via Route 688 and the *SuperLoop* transferring at the Nobel Station.

2) The use of the Nobel Drive Direct Access Ramp Park & Ride as a transit station due to its location. While members of the University Community Planning Group were concerned about sensitive lands near the project area, the site was already studied and cleared as part of the 805 Environmental Document, and is outside the scope of the project. Another concern with the location was due to its location in relation to the distance from residences and trip generating destinations. Throughout this study, however, the project team noted the importance of this station as a transfer location because of its proximity to the

805 North Managed Lanes and Nobel Drive Direct Access Ramp allowing these long distance rapid services to provide an opportunity for transferring while limiting out of direction travel.

The stakeholders involved in the project team provided constant input through the charrette process. Their comments were central to the development, evaluation, and evolution of the transit network.

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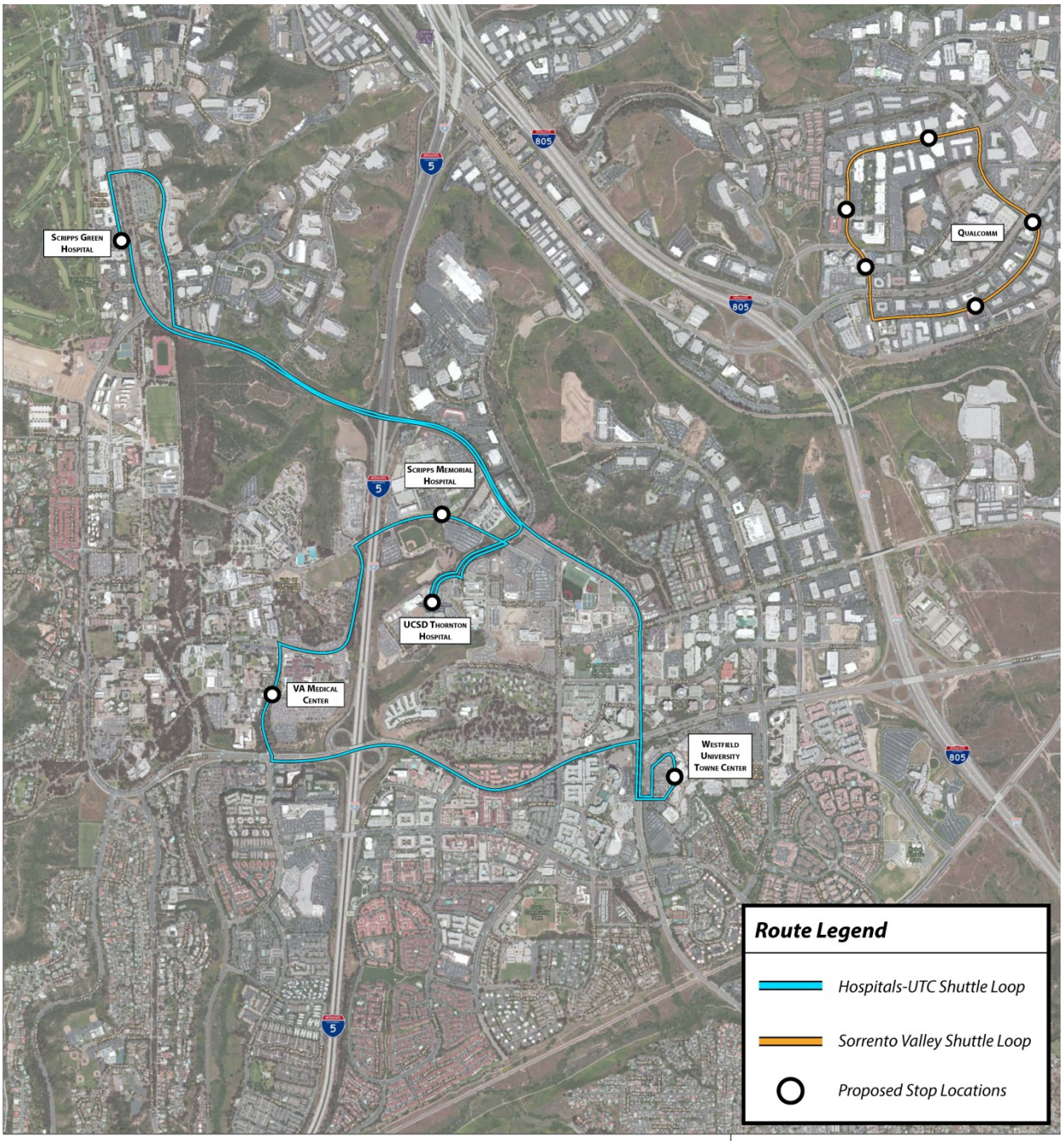
SUBJECT: Full Evaluation Results

Based on the work completed in Tasks 3.1 and 3.2 of the Interstate 805 North University Town Center (UTC)/Sorrento Valley Transit Study, a preferred network was selected (Figure 1). Major changes to the network over the course of the project include:

- Truncate Route 680 to terminate at Palomar in the South and UTC in the North.
- Expand span of service for Route 470 to all day.
- Add a deviation to Route 688 to serve the Noble Drive Station to facilitate transfers with Routes 689 and 870.
- Change alignment for Route 689 to use Eastgate Mall and Judicial Drive for access between Nobel and Genesee.
- Develop Hospital and Sorrento Valley Shuttle Loops (Figure 2).

Figure 1: Final Proposed Preferred Network

Figure 2: Proposed Hospital and Sorrento Valley Shuttle Routes

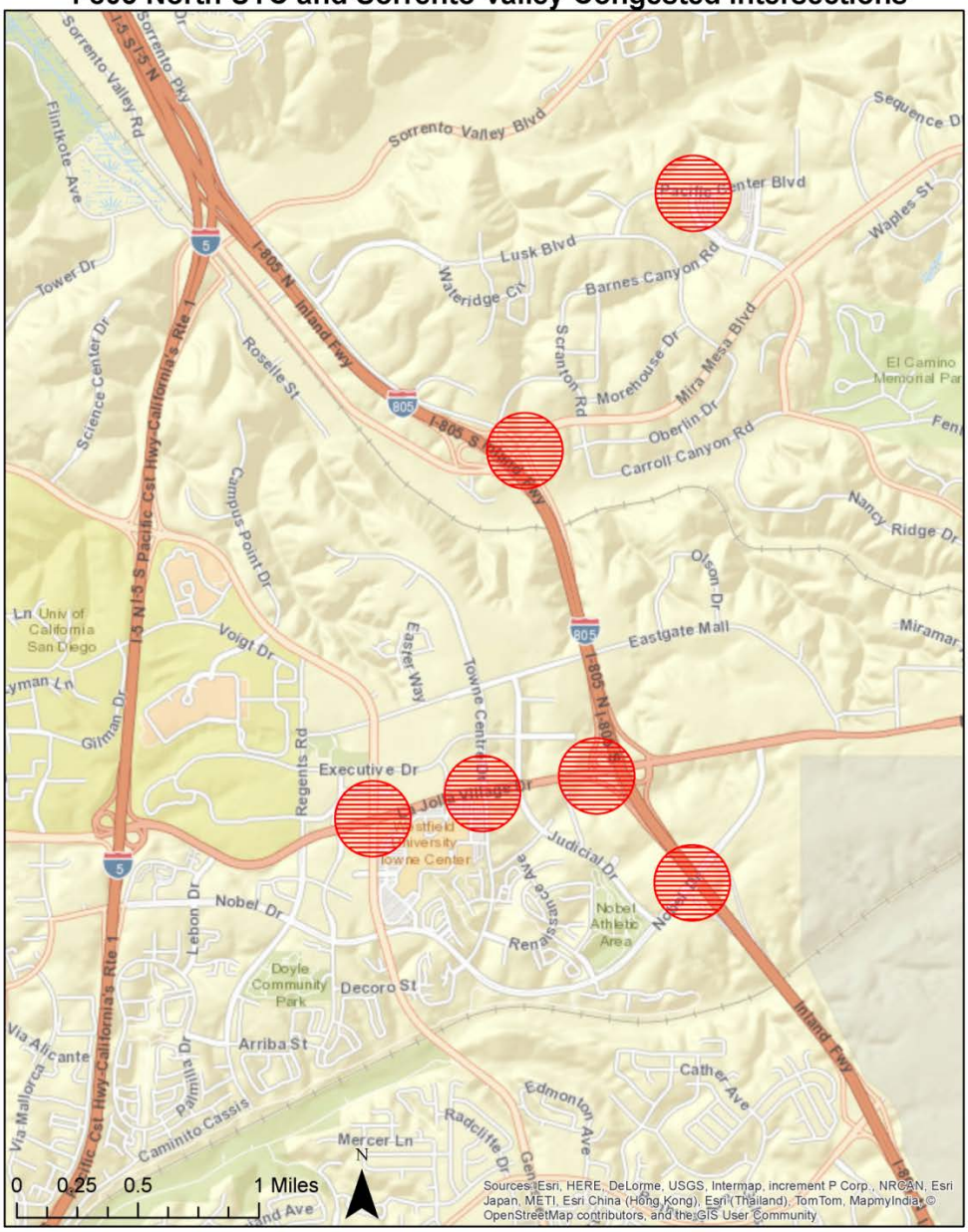


Task 4.1: Identify Congested Roadway Segments, Signal Impacts, or Areas Where Bus Lanes would be Warranted

The project team identified the following congested intersections:

A. Pacific Center Boulevard and Pacific Heights Boulevard
B. Northbound I-805 offramp at Mira Mesa Boulevard
C. Southbound I-805 onramp at La Jolla Village Drive
D. Southbound I-805 onramp at Nobel Drive
E. La Jolla Village Drive at Town Centre Drive
F. Genesee Avenue turning eastbound on to La Jolla Village Drive

I-805 North UTC and Sorrento Valley Congested Intersections



The existing (2011) and future (2030) Level of Service of intersections on Mira Mesa Boulevard was analyzed as part of a separate Mira Mesa Boulevard Traffic Study:

Existing (2011) Intersection Capacity Analysis

INTERSECTION	PEAK HOUR	EXISTING (2011)	
		LOS[2]	DELAY[3]
Mira Mesa Blvd / Black Mountain Rd	AM	F	116.9
	PM	F	134.5
Mira Mesa Blvd / Reagan Rd (E)	AM	C	29.2
	PM	B	19.6
Mira Mesa Blvd / Camino Ruiz	AM	D	52.9
	PM	E	59.8
Mira Mesa Blvd / Reagan Rd (W)	AM	C	33.1
	PM	C	30.4
Mira Mesa Blvd / Camino Santa Fe	AM	F	403.2
	PM	F	346.1
Mira Mesa Blvd / Pacific Heights Blvd	AM	D	40.4
	PM	F	128.9
Mira Mesa Blvd / Scranton Rd	AM	F	81.6
	PM	D	54.4

(1) Intersection Capacity Analysis conducted using the 2010 Highway Capacity Manual
(2) LOS = Level of Service
(3) Delay = Average Control Delay for all traffic entering the intersection during the peak hour (seconds)

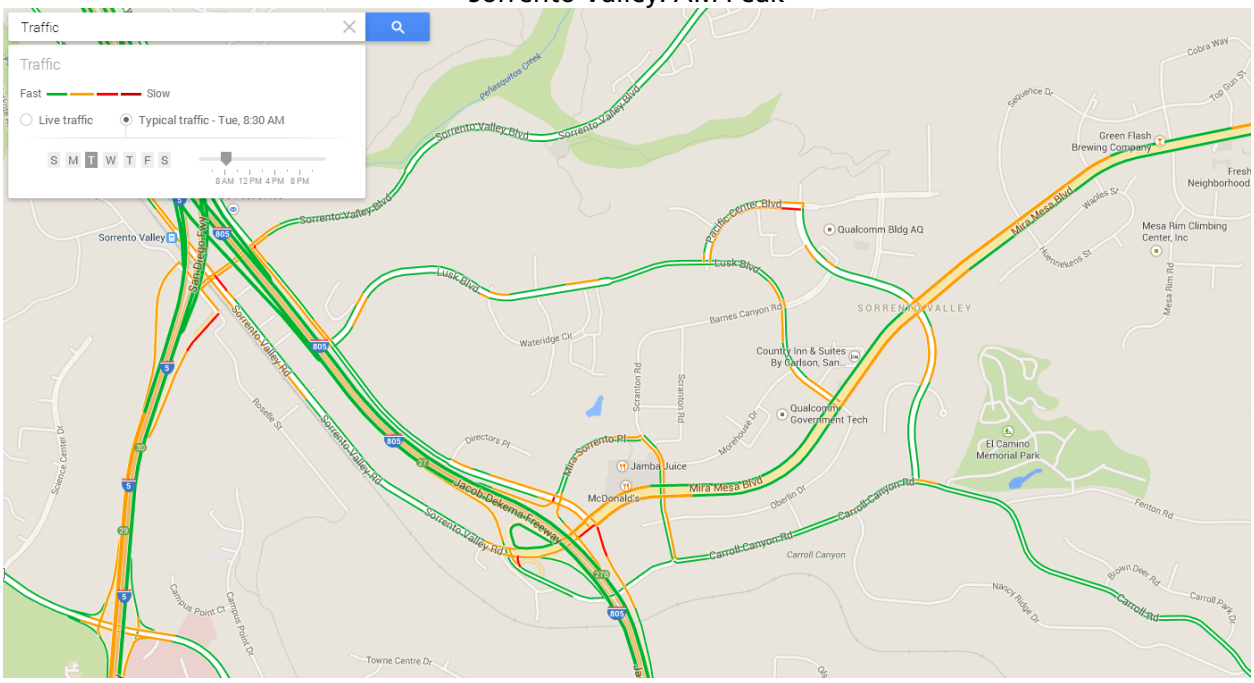
Future (2030) Intersection Capacity Analysis

INTERSECTION	PEAK HOUR	FUTURE (2030)	
		LOS[2]	DELAY[3]
Mira Mesa Blvd / Black Mountain Rd	AM	F	357.5
	PM	F	485.4
Mira Mesa Blvd / Reagan Rd (E)	AM	F	139.9
	PM	C	23.3
Mira Mesa Blvd / Camino Ruiz	AM	F	106.7
	PM	E	79.6
Mira Mesa Blvd / Reagan Rd (W)	AM	E	75.5
	PM	D	42.7
Mira Mesa Blvd / Camino Santa Fe	AM	F	582.3
	PM	F	344.6
Mira Mesa Blvd / Pacific Heights Blvd	AM	D	53.5
	PM	F	350.9
Mira Mesa Blvd / Scranton Rd	AM	F	419.9
	PM	F	364.5

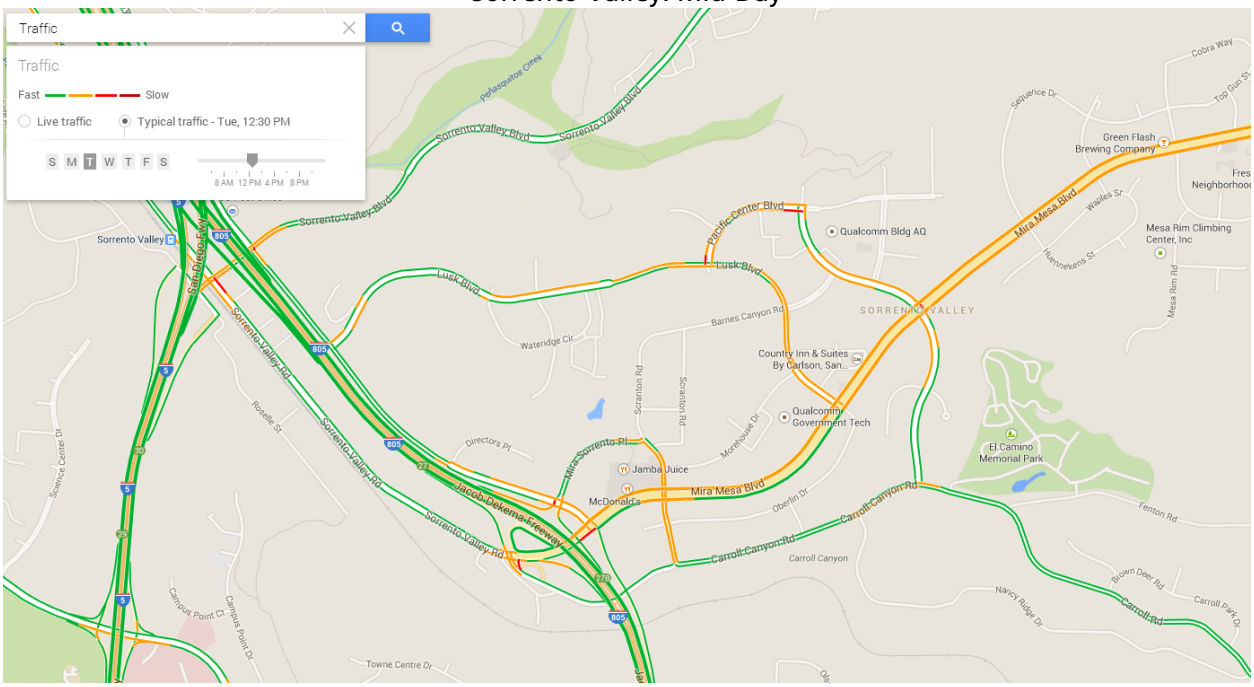
(1) Intersection Capacity Analysis conducted using the 2010 Highway Capacity Manual
(2) LOS = Level of Service
(3) Delay = Average Control Delay for all traffic entering the intersection during the peak hour (seconds)

Finally, congested roadway segments were analyzed using google traffic data for Sorrento Valley and University Town Center (UTC) during the AM peak-period, mid-day, and PM peak-period.

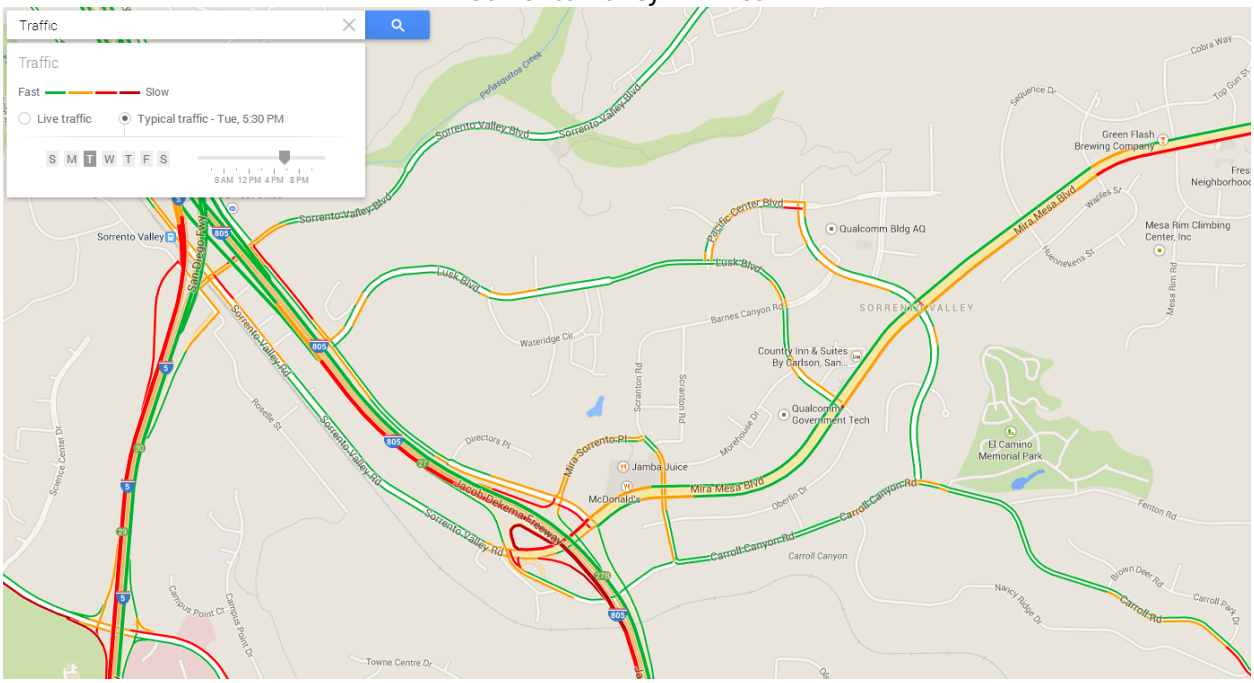
Sorrento Valley: AM Peak



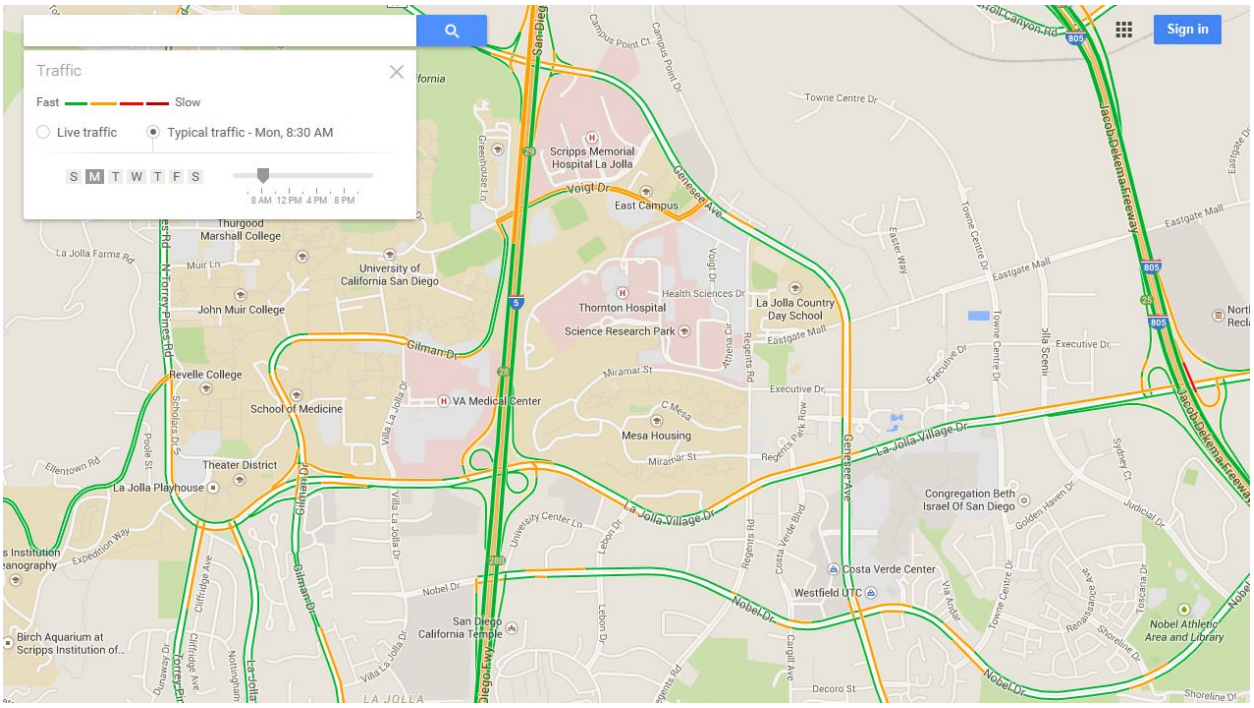
Sorrento Valley: Mid-Day



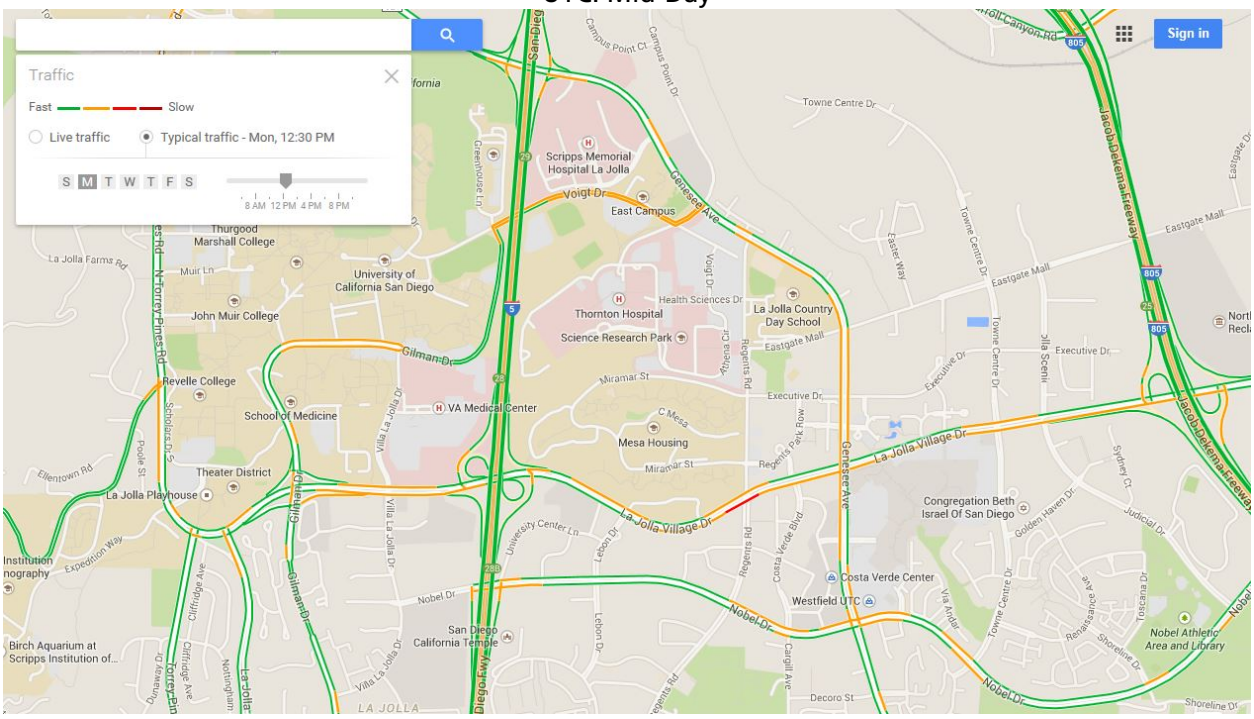
Sorrento Valley: PM Peak



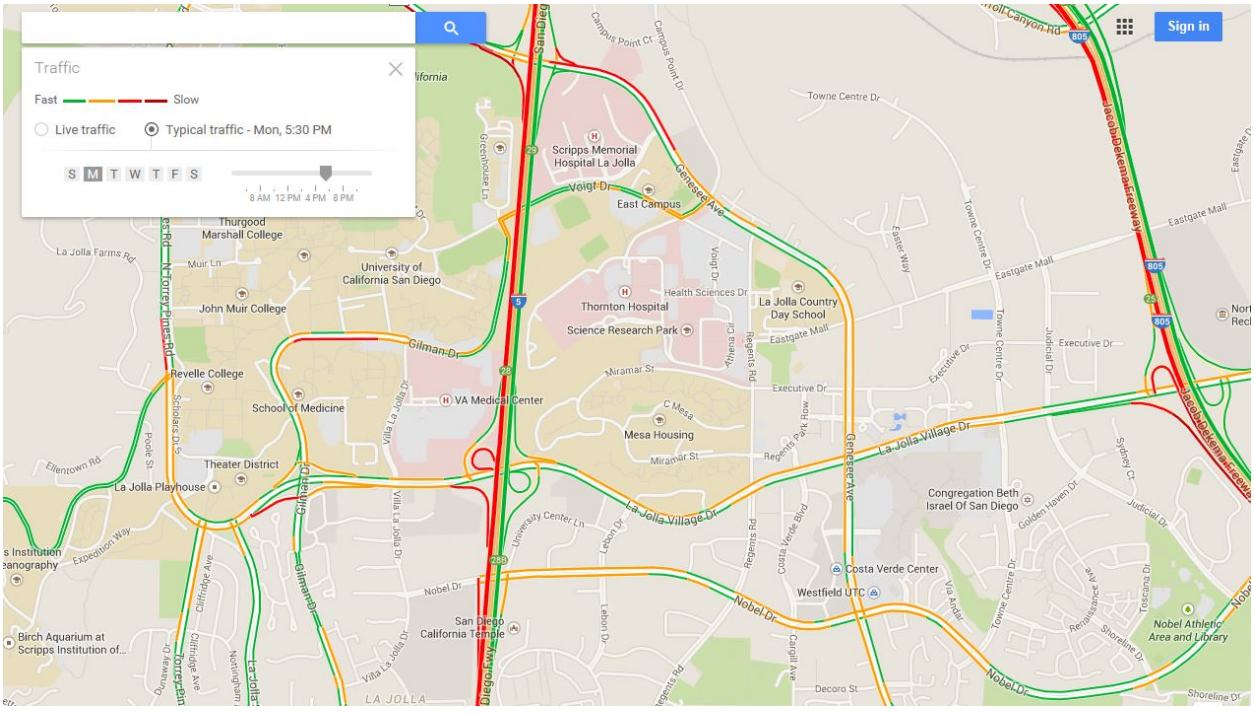
UTC: AM Peak



UTC: Mid-Day



UTC: PM Peak



Based on the above mapping excercises, the following roadwas segments were identified as congested with the best potential for transit priority measures based on proposed transit alignments.

UTC:

- Nobel Drive between Lebon and Interstate 5
- Nobel Drive between I-805 and Genesee
- La Jolla Village between Villa La Jolla and Gilman
- Genesee between N Torrey Pines Road and Campus Point Drive
- Genesee between La Jolla Village Drive and Nobel Drive

Sorrento Valley:

- Mira Mesa Boulevard between Scranton Road and Interstate 805
- Scranton Road between Carroll Canyon Road and Mira Sorrento Place
- Pacific Heights Boulevard and Pacific Center Boulevard between Barnes Canyon Road and Lusk Boulevard
- Mira Mesa Boulevard east of Sequence Drive

Task 4.2: Identify Transit Priority Measures that Would Provide the Highest Level of Travel Speed Improvement

The project team evaluated the following transit priority measures to be used in the study area to improve the circulation of transit:

1. Transit Signal Priorities (TSP) – TSP technology is used by transit vehicles to communicate with TSP equipped signaled intersections. TSP is very similar to Emergency Vehicle Pre-emption (EVP), a system that emergency vehicles utilize when they need to quickly reach a destination. Whereas EVP immediately pre-empts a signal, TSP differs from EVP in that it does not pre-empt the light but notifies the signal that the bus is near the light which then either prolongs the green or accelerates the cycle if the signal the bus is using is red to decrease the amount of time that a bus will wait. TSP operating practice will only come into effect if a bus becomes more than five minutes off schedule. TSP are designed to improve transit service schedule reliability by responding to potential vehicle travel delays.
2. Transit-Only Lanes – Transit-only lanes are dedicated lanes that can only be used by transit vehicles. Theses lanes may begin a short distance away from an intersection to allow a bus to enter it and then be one of the first vehicles to go through the intersection when the signal turns green. Also, Transit lanes may be implemented over long stretches to separate transit vehicles completely from other traffic.
3. Shared Lanes – Shared lanes allow for transit vehicles to use a right turn lane to go straight and bypass the queued cars. Shared lanes work best when the signal to go straight is preceded by a right turn lane to clear out the queued cars that are turning right so that a bus then is able to move to the front of the queue. This may increase wait times for non-transit vehicles if cars are and trucks that are turning are waiting behind a bus that is going straight.
4. Queue Jumps – Queue Jumps allow for transit vehicles to bypass the queue by creating a phase in the light cycle that only allows transit vehicles to use the intersection. Once given the queue jump the bus is able to move ahead of the vehicles that are traveling in the same direction as the bus. Queue jumps need to be paired with transit-only or shared lanes to allow for a bus to be at the start of the queue and be able to utilize the jump.
5. Signal Phasing – Signal phasing times the lights in a system so that a vehicle would have continuous greens on the street. Signal phasing creates a cohesive system with the signals so that pedestrian crossings and through intersections are timed on multiple signaled intersections to improve the circulation on the road. Signal phasing measures are intended to have travel time benefits experienced equally by all vehicles where signals are coordinated.

Sorrento Valley Transit Priority Measures

At the time of this study, a separate study on traffic analysis of Bus Rapid Transit (BRT) improvements proposed for Mira Mesa Boulevard was underway. SANDAG contracted with VPRA Technologies, TY Lin International Group, Dokken Engineering, and AECOM for this effort. Within the Mira Mesa corridor, the following seven intersections have been proposed for improvement:

- Mira Mesa Boulevard/Black Mountain Road
- Mira Mesa Boulevard /Reagan Road East/New Salem Street

- Mira Mesa Boulevard /Camino Ruiz
- Mira Mesa Boulevard /Reagan Road West
- Mira Mesa Boulevard /Camino Santa Fe
- Mira Mesa Boulevard /Pacific Heights Boulevard
- Mira Mesa Boulevard /Scranton Road

Further, two project alternatives were analyzed in the report:

- Separate Lane Alternative: This alternative provides for a transit-only lane separate from other traffic for east-west transit vehicles at key intersections along Mira Mesa Boulevard.
- Shared Lane Alternative: This alternative provides for a transit lane that is shared with right turn vehicles for east-west transit vehicles at key intersections along Mira Mesa Boulevard. This would allow transit vehicles to bypass queues in the east-west through lanes, but would cause some interference between transit vehicles and right turn vehicles. There would be cases where a transit vehicle would need to wait behind queues of right turn vehicles and cases where right turn vehicles would be unable to turn right on red if they were behind a through transit vehicle.

Some proposed improvements are common to both alternatives. These include the implementation of signal priority at all of the seven intersections identified above, installation of a transit-only lane for the southbound right turn at Mira Mesa Boulevard/Scranton Road, installation of a transit-only lane for the southbound left turn for the intersection of Mira Mesa Boulevard/Pacific Heights Boulevard, and lengthening of turn storage lanes at the intersection of Mira Mesa Boulevard/ Black Mountain Road.

Delay reductions were then analyzed for each alternative. Using 2011 traffic conditions, the separate lane alternative had a delay reduction of 139.64 seconds in the AM peak and 242.89 seconds for the PM peak for eastbound buses and 159.32 seconds in the AM peak and 53.23 seconds in the PM peak for westbound buses.

The shared lane alternative had a delay reduction of 136.86 seconds in the AM peak and 238.26 seconds for the PM peak for eastbound buses and 153.07 seconds in the AM peak and 43.34 seconds in the PM peak for westbound buses.

For both alternatives, the Transit Signal Priority was responsible for delay reductions ranging between 2.15 seconds to 4.89 seconds per intersection.

In 2030, the alternatives had significantly higher delay reduction; however, the delay reduction due to Transit Signal Priority was comparable to the 2011 scenario.

In the short-term, the Transit Signal Priority measures provide some delay reductions with minimal costs and impacts to traffic. In the longer term, separate lanes, shared lanes, and queue jumpers provide a much greater remedy to congestion from a time savings perspective.

University Town Center (UTC) Priority Measures

At the time of this study, a number of TSP have already been implemented in the UTC area for the *SuperLoop* project. The following chart details existing TSP in the UTC area, and which BRT routes would utilize them according to the proposed alignments developed through this study.

	TSP Intersection	Proposed BRT Route
2	Nobel Drive and Genesee Avenue	680, 870
3	Nobel Drive and Costa Verde Boulevard/Cargill Avenue	
5	Nobel Drive and Lebon	
6	Nobel Drive and Caminito Plaza Centro	
7	Nobel Drive and I-5 NB Off-Ramp	
8	Nobel Drive and I-5 SB On-Ramp	
10	Villa La Jolla Drive (South) and Nobel Drive	
11	Villa La Jolla Drive (South) and La Jolla Village Square	
12	Villa La Jolla Drive (South) and Via Mallorca	
13	Gilman Drive and Villa La Jolla Drive (South)	
14	Gilman Drive and Villa La Jolla Drive WB Ramps	
20	Gilman Drive and Villa La Jolla Drive (North)	470
22	Voigt Drive and Campus Point Drive	
23	Regents Road and Health Sciences Drive	
24	Regents Road and Eastgate Mall	
25	Regents Road and Executive Drive	
27	Executive Drive and Genesee Avenue	870
28	Executive Drive and Executive Way	
29	Executive Drive and Towne Center Drive	
30	Executive Drive and Judicial Drive	689
31	Judicial Drive and Golden Haven Drive/Brooke Lane	689
32	Judicial Drive and Sydney Court	689

33	Judicial Drive and Research Place	689
34	Nobel Drive and Judicial Drive	680, 689, 870
35	Nobel Drive and Shoreline Drive	680, 870
37	Nobel Drive and Towne Center Drive	680, 870

Additional TSP should be considered for the UTC area. Based on the congested intersections identified in deliverable 4.1 and the proposed alignments of the all-day BRT services, TSP should also be considered for the following intersections:

- La Jolla Village Drive and Genesee Avenue
- La Jolla Village Drive and Towne Centre Drive
- La Jolla Village Drive and I-805 SB Off-Ramp

If BRT service is implemented prior to the completion of the Nobel Drive Direct Access Ramp, TSP at the following two intersections is also recommended:

- Nobel Drive and I-805 NB Off-Ramp
- Nobel Drive and I-805 SB On-Ramp

San Diego
ASSOCIATION OF GOVERNMENTS

MEMO

3321001

SUBJECT: Costs Associated with the Implementation of Priority Measures

Because transit priority measures in University Town Center (UTC) and Sorrento Valley are being implemented to support other projects, the UTC/Sorrento Valley Project proposes utilizing these existing measures. This memo details the costs of projects that were already implemented and the costs developed for other proposed improvements included in other projects.

Sorrento Valley

Cost Estimates for Mira Mesa Boulevard Queue Jump

Scranton	$685,202
Pacific Heights	$1,283,073
Camino Santa Fe (Near Side)	$2,621,076
Camino Santa Fe (Far Side)	$1,326,567
Reagan West (Near Side)	$1,184.970
Reagan West (Far Side)	$676,522
Camino Ruiz (Near Side)	$1,895,248
Camino Ruiz (Far Side)	$774,323
Reagan E (Near Side)	$1,310,014
Reagan E (Far Side)	$618,591
Black Mountain Road	$1,115,176

Cost Estimates for Mira Mesa Transit Signal Priority

Location	Equipment	Installation
Scranton Rd.	$7,650	$4,538
Lusk Blvd/ Oberlin Dr.	$7,650	$4,538
Pacific Heights Blvd	$6,150	$3,663
Sequence Dr/ Huennekens St	$5,800	$3,663
Steadman St	$7,650	$4,038
Flanders Dr.	$6,150	$3,663
Viper Way	$7,650	$4,038
Camino Santa Fe	$8,450	$4,238
Schilling Ave / Caminito Alvarez	$6,150	$3,663
Aderman Ave	$6,150	$3,663
Parkdale Ave	$6,150	$3,663
Reagan Rd. (West)	$6,150	$3,663
Target Driveway	$7,650	$4,038
Camino Ruiz	$8,450	$4,738
New Salem St/ Reagan Rd	$6,150	$3,663
Westonhill Dr	$6,150	$3,663
Greenford Dr	$6,150	$3,663
Marbury Ave	$6,150	$3,663
Black Mountain Rd	$8,450	$4,238
Hillery Dr	$8,450	$4,238
Westview Pkwy	$7,650	$4,038
Subtotals:	**$147,000**	**$82,963**
Operations & TSP Engineering	$41,000	
20% Contingency	$54,193	
Subtotal:	**$325,155**	
City Cost Offset	$25,000	
Cooridor-wide Equipment	$5,000	
Total:	**$355,155**	
Construction Mngt. 15% of construction + equipment subtotal	**$48,773**	

UTC

No queue jumpers are planned for the UTC area. As outlined in Task 4.2, Transit Signal Priorities (TSP) was implemented at 26 intersections for the *SuperLoop* project. For simple installation of the TSP (no intersection reconfiguration), costs were minimal, ranging from approximately $11,000 to $20,000.

	TSP Intersection	Cost
2	Nobel Drive and Genesee Avenue	$14,580
3	Nobel Drive and Costa Verde Boulevard/ Cargill Avenue	$14,580
5	Nobel Drive and Lebon	$19,900
6	Nobel Drive and Caminito Plaza Centro	$14,580
7	Nobel Drive and I-5 NB Off-Ramp	$11,500
8	Nobel Drive and I-5 SB On-Ramp	$11,500
10	Villa La Jolla Drive (South) and Nobel Drive	$19,050
11	Villa La Jolla Drive (South) and La Jolla Village Square	$19,900
12	Villa La Jolla Drive (South) and Via Mallorca	$17,300
13	Gilman Drive and Villa La Jolla Drive (South)	$17,300
14	Gilman Drive and Villa La Jolla Drive WB Ramps	$14,580
23	Regents Road and Health Sciences Drive	$14,580
24	Regents Road and Eastgate Mall	$14,580
25	Regents Road and Executive Drive	$14,580
27	Executive Drive and Genesee Avenue	$11,500
29	Executive Drive and Towne Center Drive	$11,500
31	Judicial Drive and Golden Haven Drive/Brooke Lane	$18,700
32	Judicial Drive and Sydney Court	$14,100
33	Judicial Drive and Research Place	$17,500
34	Nobel Drive and Judicial Drive	$14,580
35	Nobel Drive and Shoreline Drive	$14,580
37	Nobel Drive and Towne Center Drive	$19,900

TSP Operating Cost

Based on arrangements developed for the *SuperLoop* project, Caltrans is responsible for maintaining control of the traffic controlled intersections associated with on-ramps to Interstates. SANDAG has entered into agreements with the University of San Diego, California (UCSD) and the City of San Diego to operate and maintain TSP equipment. SANDAG reimburses UCSD for costs associated with the operations and maintenance of TSP equipment located on UCSD campus. The contract associated with this reimbursement was executed in early 2013, and to date UCSD has not submitted any claims for reimbursement.

SANDAG has entered into an agreement with the City of San Diego to reimburse the City for the costs associated with the operations and maintenance of TSP equipment located in the cities jurisdiction. The City developed an estimate, and the payment structure for this agreement is a fixed amount per intersection per year in the amount of $3,130. This contract was executed in the summer of 2013, and to date the City of San Diego has not submitted any invoices. For additional TSPs implemented in the UTC and Sorrento Valley area, the $3,130/signal/year can be used a base for the operating and maintenance cost of TSP.

Task 4.3: Meeting with Impacted Stakeholders

The project team met with the following impacted stakeholders to discuss the final proposed network:

- Torrey Pines Community Planning Group – 10/3/13
- Mira Mesa Town Council – 10/7/2013
- University Community Planning Group – 10/8/2013
- San Diego City Councilmember Sherri Lightner – 10/30/13
- University of San Diego, California Director of Auxiliary Businesses Services, Robert Holden – 10/31/13

Report on Facility Needs

There are many transit priority measures that have already been applied or will be implemented within the project area due to other projects in the study area. Transit Signal Priority (TSP) technology is already utilized in *SuperLoop* intersections and the Mira Mesa Bus Rapid Transit (BRT) Improvement Study analyzes techniques that should be utilized to improve transit speed. This report summarizes the impacts that those improvements will have on the facility needs for the routes that were studied in the Interstate 805 (I-805) North University Town Center (UTC) Sorrento Valley Study.

Transit Priority Measures

The project team evaluated the following transit priority measures to be utilized in the project area to improve transit travel speed:

1. Transit Signal Priorities – TSP technology is used by transit vehicles to communicate with TSP equipped signaled intersections and notify the signal that the bus is near the light to prolong or accelerate a signal cycle. TSP operating practice will only come into effect if a bus becomes more than five minutes behind schedule.
2. Transit-Only Lanes – Transit-only lanes are dedicated lanes that can only be used by transit vehicles. Theses lanes may be over long stretches or begin a short distance from an intersection to allow a bus to enter it and then be the first vehicles to go through the intersection when the signal turns green.
3. Shared Lanes – Shared lanes allow for transit vehicles to use a right turn lane to go straight and bypass the queued cars. Shared lanes work best when the signal to go straight is preceded by a right turn lane to clear out the right turning queued cars and allow a bus to be at a the front of the queue.
4. Queue Jumps – Queue Jumps allow for transit vehicles using transit-only lanes and shared lanes to bypass the queue by creating a phase in the light cycle that only allows transit vehicles to use the intersection. Once given the queue jump the bus is able to move ahead of the vehicles that are traveling in the same direction as the bus.
5. Signal Phasing – Signal phasing times the lights in a system so that a vehicle would have continuous greens on the street. Signal phasing creates a cohesive system with the signals so that pedestrian crossings and through intersections are timed on multiple signaled intersections to improve the circulation on the road for all modes.

Congested Roadways and Intersections

The following intersections were identified by the project team as congested intersections that would benefit from the implementation of transit priority measures:

- Pacific Center Boulevard and Pacific Heights Boulevard
- Northbound I-805 offramp at Mira Mesa Boulevard
- Southbound I-805 onramp at La Jolla Village Drive
- Southbound I-805 onramp at Nobel Drive
- La Jolla Village Drive at Town Centre Drive
- Genesee Avenue turning eastbound on to La Jolla Village Drive

In addition to identify roadway segments, the project team utilized Google traffic data to identify the following congested roadway segments in the UTC and Sorrento Valley area:

UTC:

- Nobel Drive between Lebon and Interstate 5
- Nobel Drive between I-805 and Genesee
- La Jolla Village between Villa La Jolla and Gilman
- Genesee between N Torrey Pines Road and Campus Point Drive
- Genesee between La Jolla Village Drive and Nobel Drive

Sorrento Valley:

- Mira Mesa Boulevard between Scranton Road and Interstate 805
- Scranton Road between Carroll Canyon Road and Mira Sorrento Place
- Pacific Heights Boulevard and Pacific Center Boulevard between Barnes Canyon Road and Lusk Boulevard
- Mira Mesa Boulevard east of Sequence Drive

Mira Mesa Priority Measures

A concurrent but separate study on BRT improvements proposed for Mira Mesa Boulevard was done by SANDAG that contracted VPRA Technologies, TY Lin International Group, Dokken Engineering, and AECOM. The following seven intersections along Mira Mesa Boulevard were analyzed in the study to see the benefit of TSP, transit-only lanes and shared lanes:

- Mira Mesa Boulevard /Black Mountain Road
- Mira Mesa Boulevard /Reagan Road East/New Salem Street
- Mira Mesa Boulevard /Camino Ruiz
- Mira Mesa Boulevard /Reagan Road West
- Mira Mesa Boulevard /Camino Santa Fe
- Mira Mesa Boulevard /Pacific Heights Boulevard
- Mira Mesa Boulevard /Scranton Road

Using 2011 traffic conditions, the separate lane alternative had a delay reduction of 139.64 seconds in the AM peak and 242.89 seconds for the PM peak for eastbound buses and 159.32 seconds in the AM peak and 53.23 seconds in the PM peak for westbound buses.

The shared lane alternative had a delay reduction of 136.86 seconds in the AM peak and 238.26 seconds for the PM peak for eastbound buses and 153.07 seconds in the AM peak and 43.34 seconds in the PM peak for westbound buses.

For both alternatives, the TSP was responsible for delay reductions ranging between 2.15 seconds to 4.89 seconds per intersection.

In 2030, the alternatives had significantly higher delay reduction; however, the delay reduction due to TSP was comparable to the 2011 scenario.

In the short-term, the TSP measures provide some delay reductions with minimal costs and impacts to traffic. In the longer-term, separate lanes, shared lanes, and queue jumpers provide a much greater remedy to congestion from a time savings perspective. The benefit of TSP may be difficult to measure in travel time saved because the technology is only activated when a bus is more than five minutes behind schedule.

UTC and Sorrento Valley Priority Measures

A number of TSP signals have already been implemented in the UTC area for the *SuperLoop* project. The following chart details proposed BRT routes that would benefit from the existing TSP in the UTC area:

	TSP Intersection	Proposed BRT Route
2	Nobel Drive and Genesee Avenue	680, 870
20	Gilman Drive and Villa La Jolla Drive (North)	470
27	Executive Drive and Genesee Avenue	870
30	Executive Drive and Judicial Drive	689
31	Judicial Drive and Golden Haven Drive/Brooke Lane	689
32	Judicial Drive and Sydney Court	689
33	Judicial Drive and Research Place	689
34	Nobel Drive and Judicial Drive	680, 689, 870
35	Nobel Drive and Shoreline Drive	680, 870
37	Nobel Drive and Towne Center Drive	680, 870

Additional TSP should be considered for the UTC area. Based on the congested intersections identified in deliverable 4.1 and the proposed alignments of the all-day BRT services, TSP should also be considered for the following intersections:

- La Jolla Village Drive and Genesee Avenue
- La Jolla Village Drive and Towne Centre Drive
- La Jolla Village Drive and I-805 SB Off-Ramp

If BRT service is implemented prior to the completion of the Nobel Drive Direct Access Ramp, TSP at the following two intersections is also recommended:

- Nobel Drive and I-805 NB Off-Ramp
- Nobel Drive and I-805 SB On-Ramp

Cost Associated with the Implementation of Priority Measures

$1,115,176 is the median estimate for the installation of queue jumps in the Mira Mesa Boulevard Bus Rapid Transit Improvement study.

The cost estimate for TSP equipment for each intersection on Mira Mesa Boulevard ranged from $5,800 to $8,450 with $6,150 as the median cost and the installation cost ranged from $3,663 to $4,738 with $3,663 as the median cost.

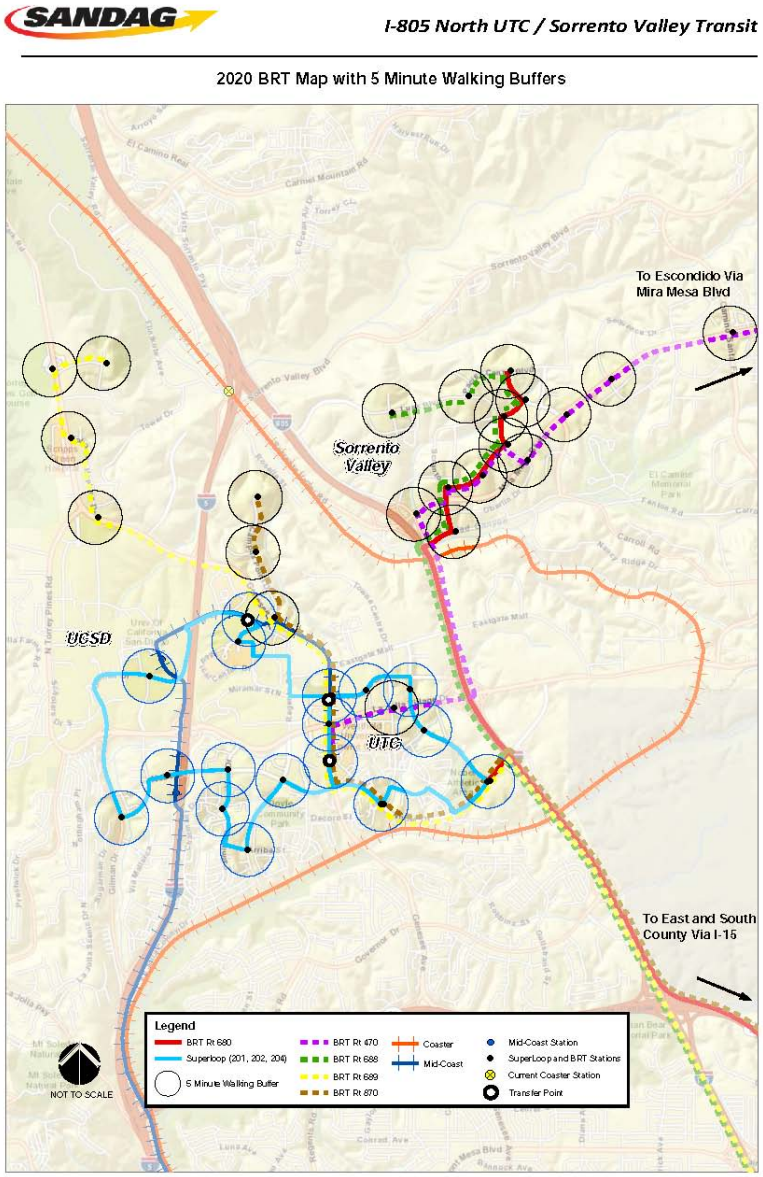
The costs for the TSP installed for the *SuperLoop* project ranges from $11,500 to $19,900 with $14,580 as the median cost.

SANDAG has entered into agreements with the City of San Diego and the University of San Diego, California (UCSD) to operate and maintain the TSP equipment on each's jurisdiction. SANDAG reimburses UCSD for any costs that are associated with maintaining TSP equipment. SANDAG reimburses the City of San Diego for TSP maintenance at a fixed amount per intersection per year in the amount of $3,130. Caltrans is responsible for maintaining control of the traffic controlled intersections associated with off and onramps to interstates and freeways.

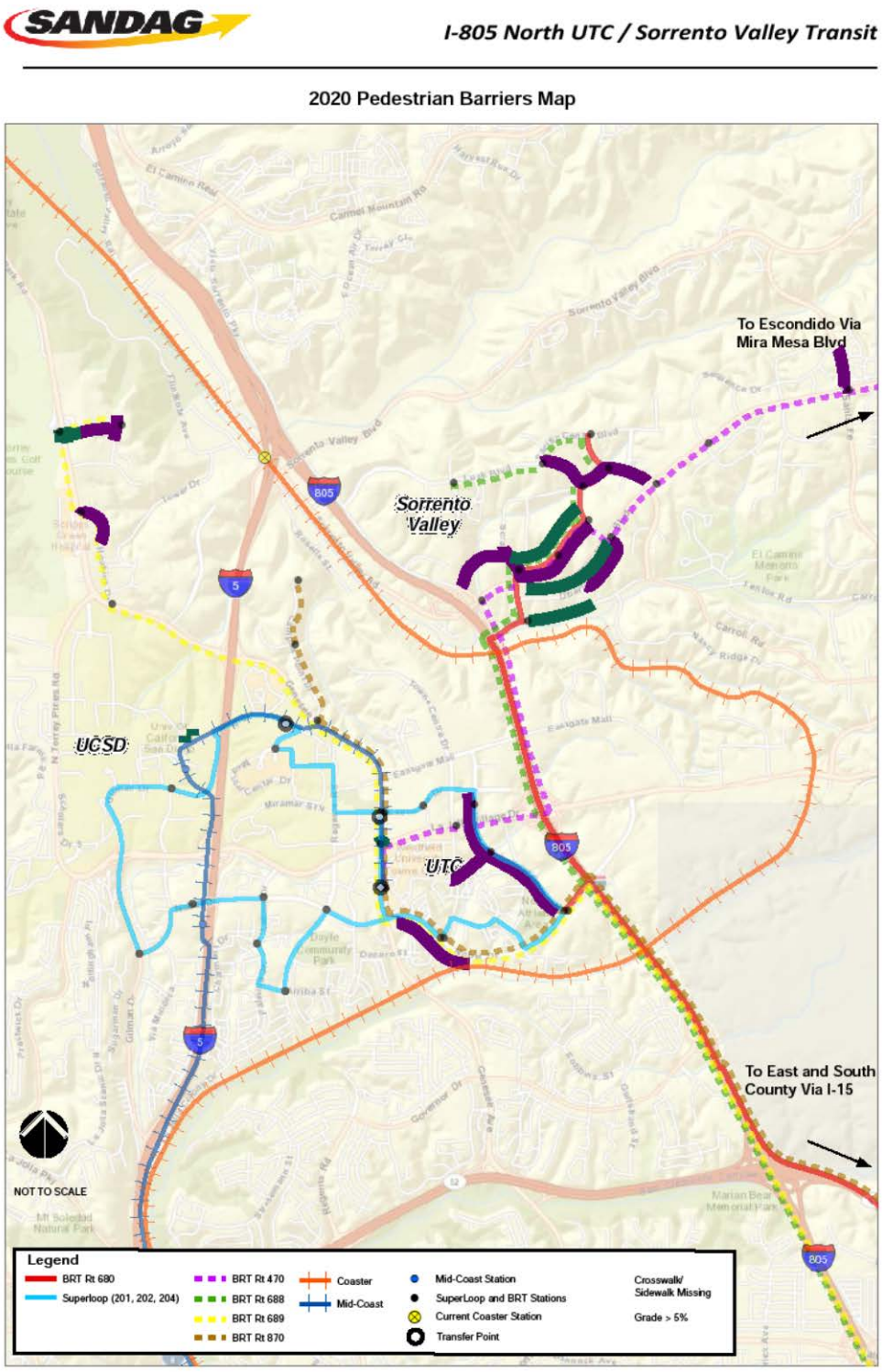
Task 5.1: Identify Pedestrian Impediments Per Safe Routes to Transit Program Identified in SANDAG's 2050 Regional Transportation Plan

Traveling to and from public transit can be one of the biggest impediments to preventing the use of public transit. Streets are often auto-oriented with poor pedestrian design and also have a lack bicycle facilities. Creating a Safe Routes to Transit plan for the study area will improve the street network to be more pedestrian and bicycle friendly. This will aid in improving the "first-mile" trips from homes to transit and also the "last-mile" trips from transit back to homes.

The project team identified pedestrian impediments to transit in the project area. First the project team mapped five minute walking buffers surrounding stations:



The study area has numerous areas of concern that create barriers for pedestrian travel. The two biggest concerns are the grade of the paths to and from transit stops and the lack of continuous sidewalks throughout the project area. The project team identified the following areas to facilitate travel to and from transit stations.



The Safe Routes to Transit Typologies were used to determine area needs. Two station areas within the project area were evaluated to determine barriers to pedestrian access to the transit stops: Lusk Boulevard at Barnes Canyon Road and Executive Drive at Genesee Avenue.

1. Sorrento Valley:
   Lusk Boulevard & Barnes Canyon Road

Safe Routes to Transit Typology: Outside Centers – Dispersed Access
Jurisdiction: City of San Diego
2050 Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS) Transit Project: Otay Mesa to Sorrento Mesa via Interstate 805 Bus Rapid Transit
Smart Growth Opportunity Area: N/A
Safe Routes to School: None

Description:
The Sorrento Mesa Area is a primary suburban employment center characterized by low-to-moderate density office parks surrounded by surface parking, limited strip commercial retail and restaurant, and a low-density street network with long intersection spacing, few signalized pedestrian crossings, and relatively wide arterial streets. Existing transit service is primarily commuter-serving, with infrequent service, and limited service hours that are focused on peak weekday commute periods. Route 880 provides connections to the University Town Center (UTC) Transit Center, Mira Mesa, and the 4S Ranch. Route 921 connects to University City, Miramar, and Mira Mesa. Route 972 is a Sorrento Mesa circulator, which provides connections from the Sorrento Valley Coaster Station through the employment areas. The Qualcomm campus represents the major employment destination in this area. Qualcomm provides a shuttle, but many employees walk between Qualcomm buildings.

Around the Stop:
Pedestrian and bicycle facilities surrounding Lusk Boulevard at Barnes Canyon Road are limited. The only existing bicycle facilities are bike lanes on Mira Mesa Boulevard a short distance away (outside the quarter-mile station area). Other connecting bikeways are planned for the area, including a bike route on Pacific Heights Boulevard between Barnes Canyon Road and Mira Mesa Boulevard and on Barnes Canyon Road between Pacific Heights Boulevard and Lusk Boulevard. Another as-yet-undetermined Class II or Class III bikeway is planned for this stretch of Lusk Boulevard. All intersections within a quarter-mile distance of the stop are signalized, providing pedestrians with designated crossing opportunities at the limited city intersections in the station area. Some intersections lack crosswalks: the convergences of Pacific Center Boulevard and Lusk Boulevard, Barnes Canyon Road and Pacific Heights Boulevard, and Pacific Mesa Boulevard and Pacific Heights Boulevard are all missing one leg. Sidewalks are generally accommodating of pedestrians, although they are in places narrow, and bus stops generally lack pedestrian amenities such as shade and benches. In places, trees on private parcels abut the sidewalk, but many of these trees do not provide direct shade to pedestrians on the public right-of way. This is particularly evident on Lusk Boulevard just north and south of Barnes Canyon Road.

Transit Service and Demographics:
Existing Trolley Riders: N/A
Existing Bus Riders (1/4 mi): 545
Population (1/4 mi): 21

Employment (1/4 mi): 8,246

Places to Walk To:
- Qualcomm Offices
- Commercial strip retail

Existing Pedestrian Facilities:
- 5 Total Intersections
- 5 Signalized Intersections (100%)
- 0 Stop-Controlled Intersections (0%)
- 0 Uncontrolled Intersections (0%)
- __ Marked Crosswalks (_%)

Places to Bike To:
- Qualcomm Offices
- Commercial strip retail

Bicycle Facilities:
- Existing Bicycle Lanes: Mira Mesa Boulevard
- Planned Bikeways: Lusk Boulevard, Pacific Heights Boulevard between Barnes Canyon Road and Mira Mesa Boulevard, Barnes Canyon Road between Pacific Heights Boulevard and Lusk Boulevard

Regional Transit Connections:
- Routes 880, 921, and 972
- Sorrento Valley COASTER Station – 2.5 miles west. Accessible via Route 972
- UTC Transit Center – 3.5 miles to the south. Accessible via Route 880

2. University Town Center
   Genesee Avenue at Executive Drive

Safe Routes to Transit Typology: Centers and Corridors – Dispersed Access
Jurisdiction: City of San Diego
2050 RTP/SCS Transit Project: Mid-Coast Light Rail Transit (LRT) Extension
Smart Growth Opportunity Area: San Diego University City; (SD-UN-2); Urban Center
Safe Routes to School: La Jolla Country Day School, Nierman Preschool

Description:
Adjacent to the University of California, San Diego (UCSD) and its related facilities and associated institutions, San Diego University City is home to the highest density and intensity of office, commercial, and residential uses and medium-high and mid- to high-rise office towers. As of 2012, numerous development projects have been approved for the area, including 750,000 square feet of neighborhood and community-serving commercial and 800 residential units in high- and mid-rise towers. Street network densities are lower than in some other urban areas, with long blocks, somewhat infrequent intersections, and a meandering street network. Nearby destinations include UCSD-affiliated centers and institutions, the university itself, and the popular Westfield University Towne Center shopping mall.

Current transit operations in the area include bus Routes 31, 960, and 979, as well as a number of local shuttles operated by UCSD and nearby private businesses. Some of these shuttles connect to the Sorrento Valley Coaster Station to the north of the station area. Commuter rail trains leaving this station reach as far north as Oceanside, where a connection to Metrolink trains is available, and as far south as Santa Fe Depot in downtown San Diego.

The Mid-Coast LRT Extension, an extension of Metropolitan Transit System's San Diego Trolley, is planned to serve the area in the future, with service slated to start in 2018. The SANDAG Board of Directors approved the Locally Preferred Alternative for the route in July 2010, which calls for a median-running section on Genesee Avenue terminating at the Westfield University Towne Center transit center.

Schools in the station vicinity include La Jolla Country Day School and Nierman Preschool. The recommendations that follow could serve as Safe Routes to School improvements for these schools.

Around the Station:
Currently, the area immediately around the intersection of Genesee Avenue and Executive Drive displays some pedestrian and bicycle amenities. Genesee Drive contains both northbound and southbound bike lanes that connect to other nearby bicycle facilities, including existing lanes on Eastgate Mall and Regents Road. Other connecting bikeways are planned, including a bike path originating on the north side of Eastgate Mall.

The majority of intersections within a quarter-mile distance of the station are signalized (73%), providing pedestrians with protected crossing opportunities at the limited number of intersections in the station area.

Some intersections lack crosswalks, however. The intersection of Genesee Avenue and Executive Drive itself has a single crossing on the eastern leg. However, east-west pedestrian travel is made possible by an overhead pedestrian bridge connecting the two sides of the street. Such bridges exist in two other locations within the quarter-mile station area. While these bridges provide separation of pedestrian and auto travel, they require more time and effort to use than traditional crosswalks.

Sidewalks are generally accommodating of pedestrians, although they are in places narrow, and bus stops generally occupy sidewalk space. Wider, higher traffic streets largely lack a defined street canopy that provides shade to the sidewalk and pedestrians passing by. In places, trees on private parcels abut the sidewalk, but many of these trees do not provide direct shade to pedestrians on the public right-of-way.

Transit Service and Demographics:
Existing Trolley Riders: N/A
Existing Bus Riders (1/4 mi): 709
Population (1/4 mi): 23,505
Employment (1/4 mi): 9,767

Places to Walk To:

- Westfield University Towne Center
- Mandell-Weiss Eastgate City Park
- Friedenberg Olympic Pool
- La Jolla Country Day School
- Nierman Preschool

Existing Pedestrian Facilities:

- 11 Total Intersections
- 7 Signalized Intersections (64%)
- 4 Stop-Controlled Intersections (36%)
- 0 Uncontrolled Intersections (0%)
- __ Marked Crosswalks (_%)

Places to Bike To:

- University of California, San Diego
- Westfield University Towne Center
- Sorrento Valley COASTER Station

Bicycle Facilities:

- Existing Bicycle Lanes: Genesee Avenue; Regents Road south of Eastgate Mall; Eastgate Mall
- Planned Bicycle Lanes: La Jolla Village Drive
- Planned Bike Paths: Extending north of Eastgate Mall
- Existing Bicycle Parking: None

Regional Transit Connections:

- Routes 31, 201, 202, 960, 979
- UTC Transit Center
- Sorrento Valley COASTER Station – 2.5 miles northwest. Accessible via UCSD COASTER East Shuttle
- Planned Mid-Coast LRT Extension

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3321001

SUBJECT: Memo Identifying Possible Solutions to Pedestrian Impediments

For Task 5.1, the Project Team identified pedestrian impediments. As a follow up, the project team identified improvements that could be implemented in the study area to improve pedestrian and bicycle access to and from transit areas:

A. Continuous sidewalks - There are roads in the study area that do not have complete sidewalks on both sides. This forces pedestrians to cross the street and then cross the street back if their destination is on the side. Some pedestrians may walk on the area without sidewalks which may cause them to enter into the street and endanger themselves by putting them in the way of traffic. Providing pedestrians complete sidewalks will reduce the amount of time that they have to walk if they must bypass areas where there is no sidewalk and improve the safety as well by providing a distinct place to walk.

B. X-pedestrian cross walks (Pedestrian scramble) - Pedestrian scrambles add an additional phase in signaled intersections that allow for only pedestrian movement. Pedestrians are able to walk in all directions with all vehicular traffic stopped by red lights. Pedestrians that would normally need to cross twice would only need to walk across the intersection. This also improves the safety for pedestrians by providing a phase where no cars are moving through the intersection.

C. Sheltered pathways - Increasing the shade and shelter along paths encourage pedestrians to use that area. During the hot months of summer, shelters and trees can provide a respite from the sun. Providing staggered shelters along sidewalks not only provides shade from the sun but also helps to protect pedestrians from rain.

D. Crosswalk stop bar improvements - More visual striping of crosswalk bars alerts cars that there is the potential for pedestrians to be crossing. Raising the stop bar also helps to alert vehicles of the upcoming crosswalk.

E. Pedestrian islands - Pedestrian islands are used in large intersection where it may be difficult for some pedestrians to cross the complete intersection. Islands are placed in between the intersections and they offer a protected space for pedestrians that are waiting for the pedestrian signal.

F. Improved lighting at intersections - Improved street lighting increases the safety of pedestrians from the cars that are driving near them and from people who may try and cause harm. Lighting increases the visibility of vehicles that are crossing intersections so that drivers may better see pedestrians crossing. The implementation of flashing lights when pedestrians enter intersection will also alert drivers that there are pedestrians present.

G. Mid-block crossings - Mid-block crossing are pedestrian crossing that are placed in the middle of the street. These crossings may reduce the distance pedestrians have to travel if a bus stop is not located near a signaled intersection.

H. Audio crosswalks - Audio crosswalks help to alert pedestrians with sight disabilities where the intersections are located, what direction they are crossing, the amount of time that they have to cross, and where the button to get the walking phase in the light is.

The Project Team also reviewed city planned infrastructure improvements in the project area:

Mira Mesa

- Reclassify Carroll Canyon Road between Sorrento Valley Road and Scranton Road from a 4-lane major street to a 4-lane collector street.
- Reclassify Scranton Road from Mira Mesa Boulevard to the Barnes Canyon extension from a local street to a 4-lane major street.
- Reclassify Barnes Canyon Road from a local street to a 4-lane collector street.

University City

- Widen Nobel Drive from Genesee Avenue to Towne Centre Drive from 4 to 6 lanes with Class II bike lanes and no widening of the roadway.
- Widen the bridge over I-5 at Nobel Drive from 2 to 4 lanes with sidewalks and Class II bike lanes.
- Construct a 4-lane bridge over Rose Canyon on Regents Road.
- Widen Regents Road from Genesee Avenue to Executive Drive from 2 to 4 lanes with Class II bike lanes.

When the project team identified pedestrian impediments in Task 5.1, the majority were located in the Sorrento Valley area. The impediments located here were both due to grade greater than 5 percent, and also missing sidewalks/crosswalks. While sidewalk/crosswalk impediments can be addressed, impediments due to grade cannot be addressed with traditional pedestrian improvements. In response, the project team proposed a Sorrento Valley Shuttle Route that would act as a last mile solution connecting the main transit stations with the trip generators in the area, without pedestrians having to deal with the steep grade.

Kimley-Horn and Associates, Inc.

Memorandum
DRAFT

401 B Street
Suite 600
San Diego, CA 92101

To: Jennifer Williamson, April De Jesus, Danielle Kochman
SANDAG

From: Edgar Torres, P.E., Raymond Lo, E.I.T.
Kimley-Horn and Associates, Inc.

Date: December 5, 2013

Subject: Costing for Shuttle Loops and Route 470 Weekday Service Span Expansion

This memorandum provides a summary of the service cost estimates for two shuttle loop services (Sorrento Valley and Hospitals-UTC) and the expansion of service for Route 470 to all day service.

Section A: Service Parameters

The service parameters set the general limits of the shuttle and fixed route services described below.

Shuttle Loop Service: Hospitals-UTC

The concept behind the Hospitals-UTC shuttle loop service is to provide shuttle service for University of California, San Diego ("UCSD") hospitals to Westfield University Towne Center ("UTC"). The following parameters were set for the Hospitals-UTC shuttle loop:

- Service span of 16 hours, from 4:00 am to 8:00 pm
- Service 6 days a week, from Mon-Sat
- Five proposed stop locations at:
    1. Scripps Green Hospital
    2. Scripps Memorial Hospital
    3. UCSD Thornton Hospital
    4. VA Medical Center
    5. Westfield University Towne Center

An exhibit of the shuttle loops with proposed stop locations is found in Appendix A (as part of this cost estimate memorandum).

TEL 619 234 9411

Shuttle Loop Service: Sorrento Valley

The primary purpose of the Sorrento Valley shuttle loop service is to provide shuttle service for patrons of the office parks located within the service area. Patrons within the service area may transfer to other transit options. The following parameters were set for the Sorrento Valley shuttle loop:

- Service span of 12 hours, from 7:00 am to 7:00 pm
- Weekday only service
- Five proposed stop locations at:
    1. Barnes Canyon Road, West of Lusk Boulevard
    2. Scranton Road, South of Barnes Canyon Road
    3. Scranton Road, South of Mira Sorrento Place
    4. Oberlin Drive, East of Scranton Road
    5. Oberlin Drive, South of Mira Mesa Blvd

An exhibit of the shuttle loops with proposed stop locations is found in **Appendix A** (as part of this cost estimate memorandum).

Route 470 Weekday Service Span Expansion

The purpose of the Route 470 weekday service span expansion is to address demand for all day service from Rancho Bernardo BRT station to Gilman Drive at UCSD, and vice versa. The following parameters were set for the Route 470 weekday service span expansion:

- Expanded service during the mid-day peak from 12:00 pm to 2:00 pm, with service headways of 15 minutes in each direction
- Expanded service during the evening from 7:30 pm to 11:30 pm, with service headways of 20 minutes in each direction

Section B: Methodology and Assumptions

Shuttle Loop Services

To estimate the service costs of the shuttle loop services, a conceptual route was laid out for each shuttle service. The distance of each conceptual route alignment was measured. Using an assumed average speed, a route travel time was estimated by dividing the distance by the average speed. The total travel time was estimated by summing the route travel time and stops travel time. Lastly, using an assumed operating cost per hour, a daily, weekly, and annual cost was estimated for each shuttle service.

The following assumptions were made as part of the cost estimation:

- Average speed of 18 miles per hour (mph) for Hospitals-UTC shuttle service and 15 mph for Sorrento Valley shuttle service
- Operating cost of $50 per hour; value will vary depending on contracting model
- Average dwelling time at each stop is 40 seconds per stop
- Cycle time is 1.1 times the travel time and adjusted to the nearest “clock face interval” (e.g. 5, 10, 15, 20, 30 minutes)

Route 470 Weekday Service Span Expansion

To estimate the service costs of the Route 470 weekday service span expansion, current operating service data for MTS's Route 470 designation (Route 236 BRT-15). Utilizing data collecting from MTS, an average time per trip was calculated. Using the average time per trip, the total trip time from the service span expansion could be calculated by taking the product of the additional trips by the average time per trip. Service costs were estimated using the MTS FY'14 fully allocated cost per in-service hour of $116.97.

The following assumptions were made as part of the cost estimation:

- The fully allocated cost per in-service hour includes all costs associated with deadhead and layovers

A breakdown of the cost estimation methodology and analysis is found in **Appendix B** (as part of this cost estimate memorandum).

Section C: Service Cost Estimates

Shuttle Loop Services

The annual cost for the Hospitals-UTC shuttle service is estimated to be approximately $500,000 per year.

The annual cost for the Sorrento Valley shuttle service is estimated to be approximately $190,000 per year.

Route 470 Weekday Service Span Expansion

The cost of the Route 470 service span expansion is estimated to be approximately $940,000 of additional costs per year. The current route costs are estimated to be approximately $1,870,000 per year. The Route 470 service span expansion will result in an increase of approximately 50% per year.

APPENDIX A

- ***Shuttle Loop Services Exhibit***

SCRIPPS GREEN HOSPITAL

SCRIPPS MEMORIAL HOSPITAL

UCSD THORNTON HOSPITAL

VA MEDICAL CENTER

QUALCOMM

WESTFIELD UNIVERSITY TOWNE CENTER

Route Legend

- Hospitals-UTC Shuttle Loop
- Sorrento Valley Shuttle Loop
- Proposed Stop Locations

SANDAG

Proposed Hospitals-UTC and Sorrento Valley Shuttle Loops

0 0.25 0.5 1 Mile

APPENDIX B

- ***Cost Estimation Tables***

North UTC / Sorrento Valley Transit Study
Cost Estimates for Proposed Hospitals-UTC and Sorrento Valley Shuttle Loops

Hospitals-UTC Shuttle Loop

Item	Value	Unit
Distance	8.7	[mi]
Avg. Speed	18.0	[mph]
Travel Time for Route	29.0	[min]
# Stops	5	[stop]
Time per Stop	40	[sec/stop]
Travel Time for Stops	200	[sec]
Total Travel Time	32.3	[min]
Total Cycle Time	**40**	**[min]**

Item	Value	Unit
Operating Cost per Hour	50	[$/hour]
Service Span	16	[hr/day]
Headway	20	[min]
# of Trips per Day	48	[trip/day]
Daily Cost (by Time)	**$ 1,600.00**	**[$/day]**
Weekly Cost (by Time)	**$ 9,600.00**	**[$/week]**
Annual Cost (by Time)	**$ 500,000.00**	**[$/year]**

Sorrento Valley Shuttle Loop

Item	Value	Unit
Distance	2.0	[mi]
Avg. Speed	12.0	[mph]
Travel Time for Route	10.0	[min]
# Stops	5	[stop]
Time per Stop	40	[sec/stop]
Travel Time for Stops	200	[sec]
Total Travel Time	13.3	[min]
Total Cycle Time	**15**	**[min]**

Item	Value	Unit
Operating Cost per Hour	50	[$/hour]
Service Span	12	[hr/day]
Headway	15	[min]
# of Trips per Day	48	[trip/day]
Daily Cost (by Time)	**$ 600.00**	**[$/day]**
Weekly Cost (by Time)	**$ 3,600.00**	**[$/week]**
Annual Cost (by Time)	**$ 190,000.00**	**[$/year]**

North UTC / Sorrento Valley Transit Study
Cost Estimates for Route 470 Expansion to All-Day Weekday Service

Current

Item	Value	Unit
In-Service Trips	81	[trips/day]
In-Service Duration	60.77	[hr/day]
In-Service Miles	1558	[mi/day]

Expansion

Mid-Day Expansion (12 PM - 2 PM)

Item	Value	Unit
Frequency (Each Direction)	15	[min/trip]
In-Service Trips	16	[trips/day]
In-Service Duration	12.00	[hr/day]
In-Service Miles	308	[mi/day]

Evening Expansion (7:30 PM to 11:30 PM)

Item	Value	Unit
Frequency (Each Direction)	20	[min/trip]
In-Service Trips	24	[trips/day]
In-Service Duration	18.00	[hr/day]
In-Service Miles	462	[mi/day]

Total (Mid-Day + Evening Expansion)

Item	Value	Unit
In-Service Trips	40	[trips/day]
In-Service Duration	30	[hr/day]
In-Service Miles	769	[mi/day]

Costs (Current+Extension)

Parameters

Item	Value	Unit
Fully Allocated Cost per In-Service Hour	$ 117	[$/hr]

Current Costs

Item	Value	Unit
Daily Cost (Current)	$ 7,200	[$/day]
Weekly Cost (Current)	$ 36,000	[$/week]
Annual Cost (Current)	$ 1,870,000	[$/year]

Expansion Costs

Item	Value	Unit
Daily Cost (Expansion)	$ 3,600	[$/day]
Weekly Cost (Expansion)	$ 18,000	[$/week]
Annual Cost (Expansion)	$ 940,000	[$/year]

Total Costs (Current + Expansion)

Item	Value	Unit
Total In-Service Duration (Current + Expansion)	$ 91	[hr/day]
Daily Cost (Current + Expansion)	**$ 10,800**	**[$/day]**
Weekly Cost (Current + Expansion)	**$ 54,000**	**[$/week]**
Annual Cost (Current + Expansion)	**$ 2,810,000**	**[$/year]**

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SUBJECT: Memo on Phasing Options

Task 6.2 involves analyzing the phasing options for the implementation of capital improvements and Bus Rapid Transit (BRT) and local/shuttle services based on funding availability and implementation timeframes for Managed Lanes (Caltrans) and transit priority measures/pedestrian improvements.

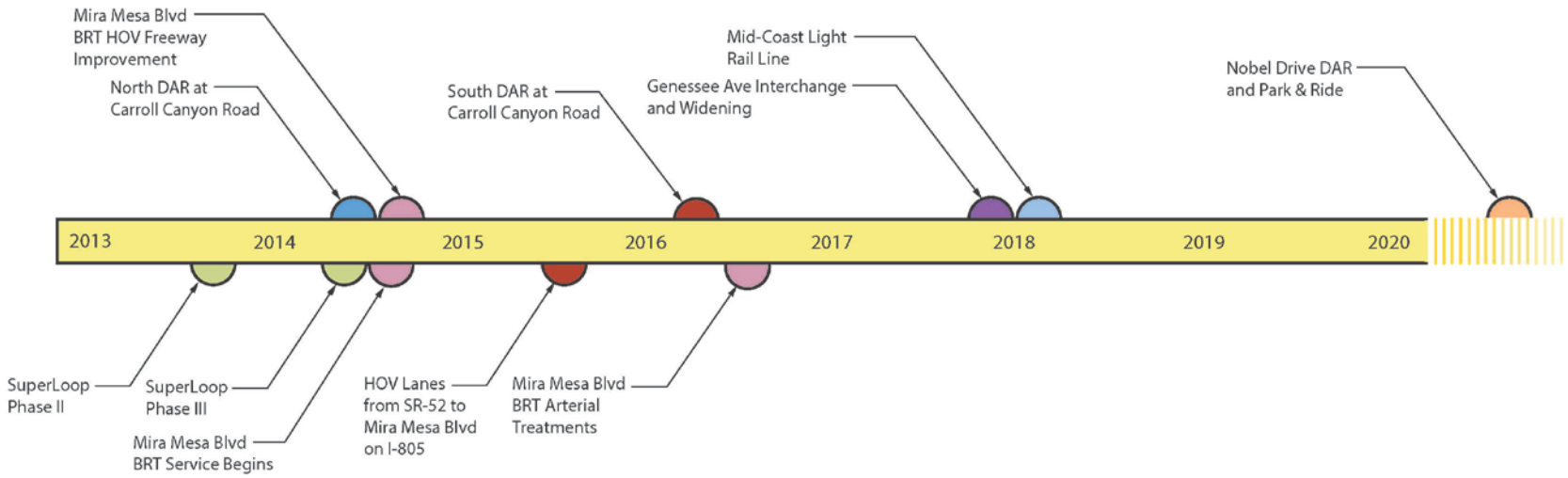
The project team discussed phasing strategies in depth at Charrette Meeting #3 on October 25, 2013. The phasing strategies recommended by the project team are as follows:

- Route 470 (peak only) service anticipated September 2014; future improvements include transition to all-day service when funding is available.
- Route 680 (peak only) service anticipated in 2015; and transitioning to all-day service in 2030 when funding may be available
    - Possibility for Route 680 to go to Campus Point Drive for the short-term
- It is ideal for Route 688 to be phased with Plaza Boulevard In-Line Station
    - Route 688 has the advantage of expanding the scope of network
    - Concern of San Ysidro and the infrastructure there to support Route 688
    - Concerns over whether Route 688 is faster than Mid-Coast
    - The timing of Route 688 is solely dependent on fleet procurement
- Demand for service from National City to the Sorrento Valley area is just as strong as the rest of the South Bay, and service should be expanded there to provide balanced service to communities East and West of the Interstate 805 (I-805).
    - Possibility to extend Route 960 south, Highland Avenue
    - Possibility to extend Route 150 to National City
- Route 870 is not a part of *TransNet* funding, and depending on funding opportunities may not come into service until 2030.
- Recommended order of implementation of BRT Routes
    - 470
    - 680
    - 870
    - 688
    - 689

While phasing for these routes was discussed in terms of demand and ridership development, there were also discussions about the timing of capital improvements that would support the BRT.

Infrastructure Projects Completion Timeline

Phase II: Infrastructure Improvements + BRT Mapping Development (2 of 10)



*** Note:** Voigt DAR construction timeline will be post-2020, was programmed late as part of North Coast Corridor; North Facing DAR will be constructed first.

Due to funding issues and other factors, many of these capital projects face significant schedule delays outside the scope of this project. For example, the Nobel Direct Access Ramp which will be utilized by Routes 680, 688, 689, and 870 has been pushed out significantly past 2020. Therefore, implementation of these BRT Routes should not be contingent on the construction of capital projects, and interim operating plans should be developed to provide fast, reliable service in these corridors based on the phasing discussion above.

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SUBJECT: Memo on Final Implementation and Phasing Plan

The phasing options for the Bus Rapid Transit (BRT) and shuttle services were developed and analyzed based on funding availability and implementation timeframes for freeway improvements and transit priority measures. Through this analysis, recommendations were developed for consideration for inclusion in the next Regional Transportation Plan update:

Route	Span of Service	Year
470	Peak-Period	2014
680	Peak-Period	2018
470	All-Day Service	2025
Sorrento Valley Shuttle Loop	All-Day Service	2025
680	All-Day Service	2025
Hospitals-UTC Shuttle Loop	All-Day Service	2025
870	Peak-Period	2030
688	Peak-Period	2030
689	Peak-Period	2030

By implementing peak-period service on the Route 680, it would begin building demand and ridership development in the 805 corridor. Since peak-period service would begin on both Routes 470 and 680 before the freeway improvements are completed, interim operating plans would need to be developed. Once ridership for the corridor has been developed, all-day service would be implemented. Finally, Routes 688 and 689, which would potentially be considered Premium Express Routes and Route 870 would not be implemented until the Nobel Direct Access Ramp is completed.

The maps including the final recommended alignments for the proposed BRT services and the shuttle routes are included on the following pages.

Figure 1: Final Proposed Preferred Network

Figure 2: Proposed Hospital and Sorrento Valley Shuttle Routes

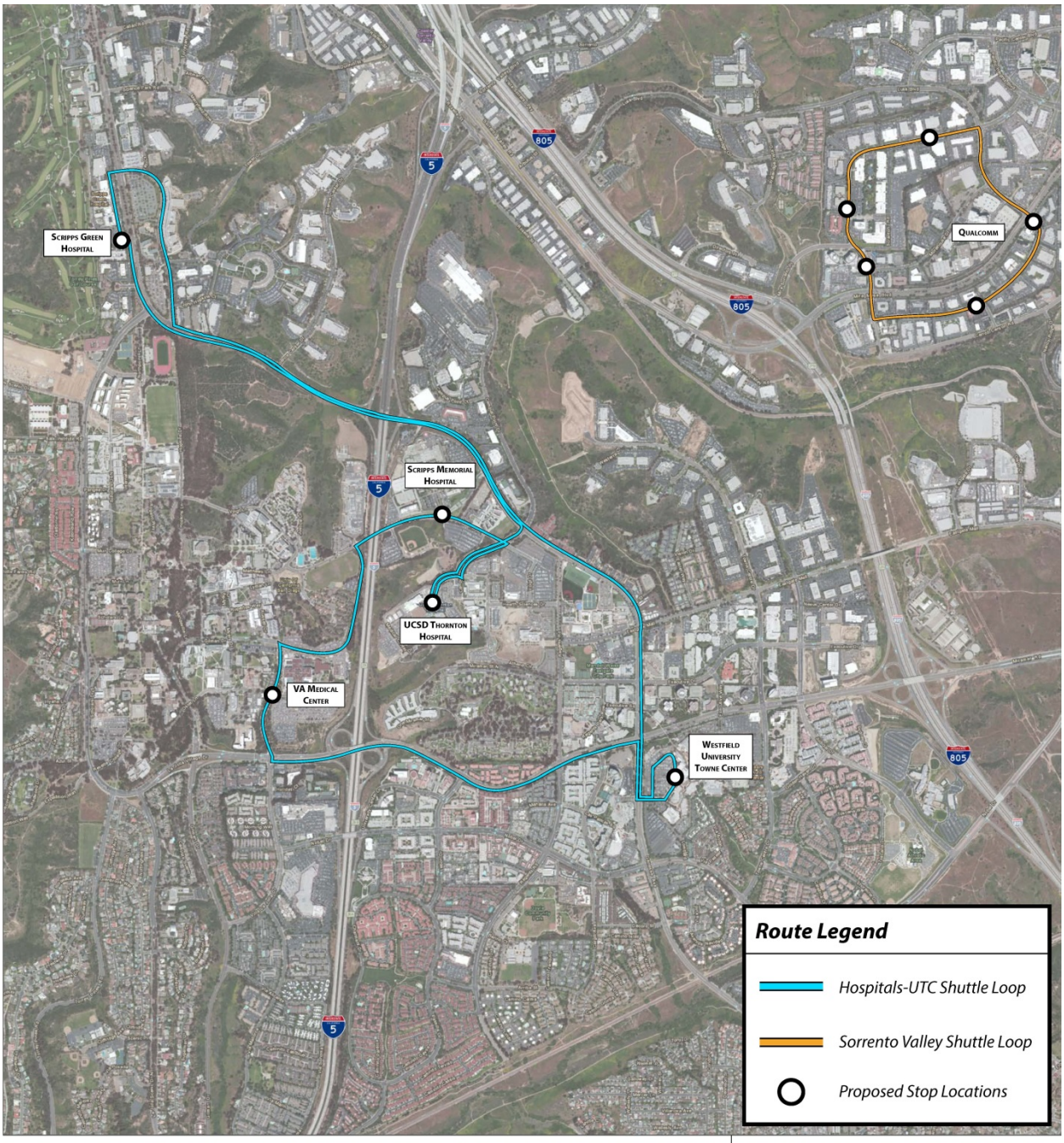
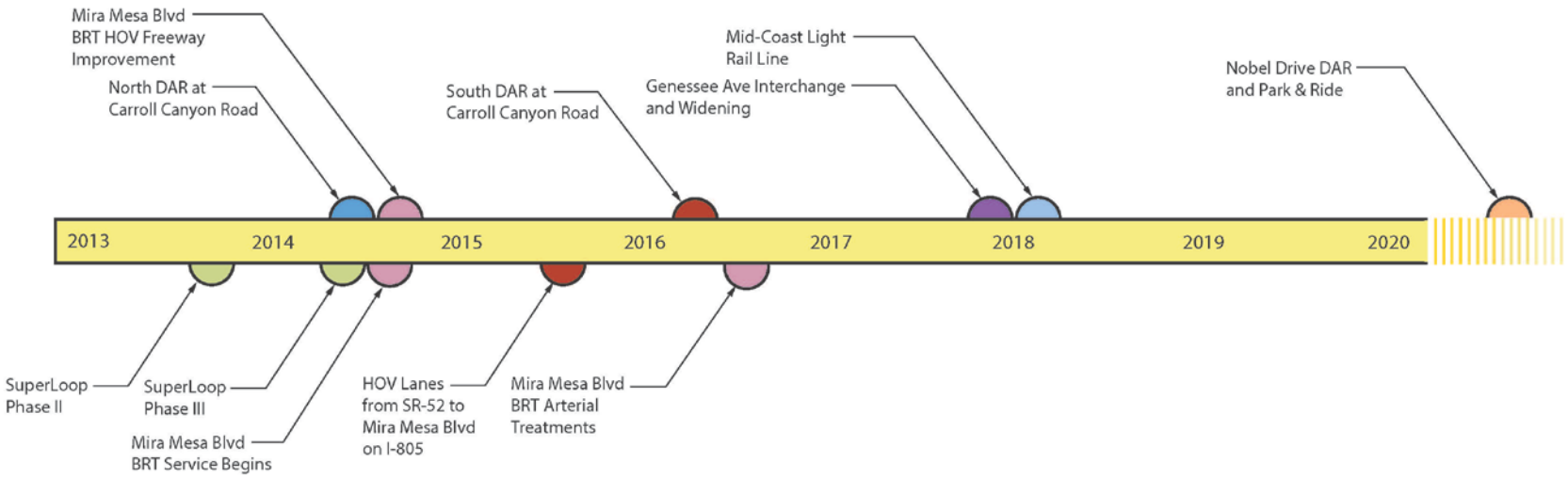


Figure 3: Infrastructure Timeline

Infrastructure Projects Completion Timeline

Phase II: Infrastructure Improvements + BRT Mapping Development (2 of 10)



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