



**TECHNICAL ADVISORY COMMITTEE
DRAFT AGENDA**

DATE: **Thursday, August 25, 2016**
TIME: **10:00 a.m. – 12:00 p.m.**
LOCATION: **ICTC Offices
1405 N. Imperial Ave., Suite 1
El Centro, CA 92243**

Chairperson: City of Imperial

Vice-Chair: City of Brawley

Individuals wishing accessibility accommodations at this meeting, under the Americans with Disabilities Act (ADA), may request such accommodations to aid hearing, visual, or mobility impairment by contacting ICTC offices at (760) 592-4494. Please note that 48 hours advance notice will be necessary to honor your request.

PUBLIC COMMENTS

Any member of the public may address the Committee for a period not to exceed three minutes on any item of interest not on the agenda within the jurisdiction of the Committee. The Committee will listen to all communication, but in compliance with the Brown Act, will not take any actions on items that are not on the agenda.

DISCUSSION/ACTION ITEMS

1. Introductions
2. Adoption of the minutes for May 26, 2016 ACTION
Requesting a motion to adopt
3. San Diego State University /Imperial Valley College ACTION
Transit Shuttle Analysis
*Recommendation to Forward to Commission for Adoption
Presented by ICTC Staff*
4. Regional Climate Action Plan and Green Region Initiative INFORMATION
Presented by SCAG Staff
5. ICTC Updates / Announcements DISCUSSION
Presented by ICTC Staff
 - a. Transit Planning Updates
 - b. Transportation Planning Updates
 - c. LTA Updates
6. Cities and County Planning / Public Works Updates DISCUSSION
All

**CITIES OF BRAWLEY, CALEXICO, CALIPATRIA, EL CENTRO, HOLTVILLE, IMPERIAL, WESTMORLAND,
IMPERIAL IRRIGATION DISTRICT AND COUNTY OF IMPERIAL**

7. SCAG Updates / Announcements DISCUSSION
Presented by SCAG staff
8. FFY 15-16 CMAQ & RSTP Project list – RFA Updates DISCUSSION
Presented by ICTC Staff

Agency	Fund Type	Project Name	Total Project Cost (in thousands)	Status
Brawley	RSTP	S. Palm Ave. Rehab	\$734	3/4/16 RFA submittal for construction
Brawley	CMAQ	Sidewalk Rehab-Variou	\$300	Design in May (still in process) Mid-June RFA submittal
Calipatria	CMAQ	S. International Ave. Sidewalk	\$123	ROW in Feb., RFA 4/8/16, Design fully done-COMPLETED
El Centro	RSTP	Ross Ave. Rehab	\$571	Design in March, RFA submitted in April
Holtville	RSTP	Walnut Ave.	\$562	E-76 rcvd 1/28/16, begin construction 3 rd /wk of May
Holtville	CMAQ	Cedar Ave. Sidewalk	\$136	Still in Design
Imperial County	CMAQ	Various Roads	\$1,102	In Design, environmental issues to get ROW approved, then Const.
Westmorland	RSTP	N. Center St. Pavement Rehab	\$372	PE RFA submitted 2/25/16, E76 rcvd, RFA for Const. end of May

9. Caltrans Updates / Announcements DISCUSSION
Presented by Caltrans Staff
10. General Discussion / New Business DISCUSSION
All
11. Adjournment

The next meeting of the ICTC TAC will be replaced by the Caltrans and Imperial County External Teambuilding meeting scheduled for September 22, 2016. An email with details will be sent at a later time. For questions you may call Cristi Lerma at (760) 592-4494 or contact by email at cristilerma@imperialctc.org.



1405 N. IMPERIAL AVE., SUITE 1
EL CENTRO, CA 92243-2875
PHONE: (760) 592-4494
FAX: (760) 592-4497

TECHNICAL ADVISORY COMMITTEE
DRAFT MINUTES

May 26, 2016

Present:

Guillermo Sillas	City of Brawley
Steven Sullivan	City of Brawley
Lily Falomir	City of Calexico
Terry Hagen	City of El Centro
Abraham Campos	City of El Centro
Hector Orozco	City of Holtville
John Gentry	City of Imperial

Others:

Virginia Mendoza	ICTC
Cristi Lerma	ICTC
Mark Baza	ICTC
David Salgado	SCAG
Andrea Montano	The Holt Group
Wishing Lima	Caltrans

1. The meeting was called to order by Chair Gentry at 10:02 a.m. A quorum was present and introductions were made. There were no public comments.
2. A *motion* was made to adopt the minutes for April 28, 2016, as amended. (Sullivan/Campos)
Motion Carried.
3. FFY 2015-16 CMAQ & RSTP Project List – RFA Updates

Agency	Fund Type	Project Name	Total Project Cost (in thousands)	Status
Brawley	RSTP	S. Palm Ave. Rehab	\$734	3/4/16 RFA submittal for construction
Brawley	CMAQ	Sidewalk Rehab-Variou	\$300	Design in May (still in process) Mid-June RFA submittal
Calipatria	CMAQ	S. International Ave. Sidewalk	\$123	ROW in Feb., RFA 4/8/16, Design fully done-COMPLETED

El Centro	RSTP	Ross Ave. Rehab	\$571	<i>Design in March, RFA submitted in April</i>
Holtville	RSTP	Walnut Ave.	\$562	<i>E-76 rcvd 1/28/16, begin construction 3rd/wk of May</i>
Holtville	CMAQ	Cedar Ave. Sidewalk	\$136	<i>Still in Design</i>
Imperial County	CMAQ	Various Roads	\$1,102	<i>In Design, environmental issues to get ROW approved, then Const.</i>
Westmorland	RSTP	N. Center St. Pavement Rehab	\$372	<i>PE RFA submitted 2/25/16, E76 rcvd, RFA for Const. end of May</i>

4. ICTC Updates / Announcements

- Transit Planning Updates
 - There were none.
- Transportation Planning Updates (By Virginia Mendoza):
 - The Regional Mobility Hubs Project will be having “pop-up” outreach events on May 31, 2016 at the Brawley Transfer Station; June 1, 2016 at IVC Campus Transit Station at entrance 3 at Old Hwy 111; and, on June 2, 2016 at the El Centro Regional Transit Terminal. All three events will be from 6:30 a.m. to 6:30 p.m.
 - The SDSU/IVC Transit Shuttle Analysis is in the final stages and will be presented to Management and Commission at the June or July meeting.
 - A Budget Workshop was held on May 25th and it went relatively well. It is expected that the budget adoption will occur at the June meeting.
- LTA Updates:
 - Staff is currently working on two submittals and will be processed within the next week. Agencies should be receiving reimbursements soon. The goal is to expend on the money.

5. Cities and County Planning / Public Works Updates:

- The Cities of El Centro, Imperial and Brawley gave an update on their current projects.

6. SCAG Updates / Announcements: (By Mr. Salgado)

- Mr. Salgado encouraged agencies to apply for the ATP program. He stated that there are many resources including a recently released scoring rubric by the CTC that is available on the SCAG website. The deadline to apply is July 15, 2016. Ms. Mendoza reminded all that there is also an opportunity for the regional share with projects in the \$700k to \$800k scope. An important resource to use in the recently adopted SR2S Masterplan for Imperial County.

7. Caltrans Updates / Announcements

- Ms. Mendoza reminded committee members that the ICTC/Caltrans External Teambuilding meeting would be replacing the TAC next month.
- Mr. Lima provided all with DLAE updates. A handout was distributed.
 - Important announcements included the deadline for ATP projects: June 15, 2016 for projects programmed in FY’s 2019/20-2020/21.
 - Highway Bridge Program can be fully funded using toll credits.

8. General Discussion / New Business

- Next TAC meeting will be replaced with the ICTC/Caltrans External Teambuilding Meeting on June 23, 2016 at the IID Water Control Conference Room.

9. Meeting adjourned at 10:41a.m. ([Sullivan/Campos](#)).



1405 N. IMPERIAL AVE., SUITE 1
EL CENTRO, CA 92243-2875
PHONE: (760) 592-4494
FAX: (760) 592-4497

August 19, 2016

ICTC Technical Advisory Committee
Imperial County Transportation Commission
1405 N. Imperial Ave, Suite 1
El Centro, CA 92243

SUBJECT: San Diego State University / Imperial Valley College Transit Shuttle Analysis

Dear Committee Members:

The San Diego State University / Imperial Valley College Transit Shuttle Analysis completed by the AECOM consultant team assessed the feasibility of an inter-college campus shuttle service in Imperial County. A technical advisory committee team comprised of staff from SDSU - Imperial Valley Campuses, Imperial Valley College, SCAG, ICTC and Caltrans provided guidance in the development of the project deliverables. A critical element of the project deliverables included multiple outreach efforts at the campuses of SDSU-Calexico, IVC and SDSU - Brawley.

The study developed a phased approach for implementation and future consideration. The consultant team completed the 2nd round of outreach at SDSU - Calexico, IVC and SDSU - Brawley campuses to obtain input from the student body regarding these proposed route alternatives.

The study alternatives were presented to the IVC Board of Trustees on June 15, 2016. The IVC Board of Trustees expressed support for the project and future implementation of the first phase when funds are available. The AECOM consultant team presented to Management and Commission in July 2016 as an information item only. Attached are the Draft Executive Summary and presentation. The Draft Technical Memorandums are available on our website at <http://www.imperialctc.org/campus-transit-study/>.

It is requested that the ICTC Technical Advisory Committee forward this item to the Management Committee and Commission for their review and approval after public comment, if any:

1. Approve the San Diego State University / Imperial Valley College Transit Shuttle Analysis

Sincerely,

A handwritten signature in blue ink that reads 'Mark Baza'.

MARK BAZA
Executive Director

CITIES OF BRAWLEY, CALEXICO, CALIPATRIA, EL CENTRO, HOLTVILLE, IMPERIAL, WESTMORLAND, IMPERIAL IRRIGATION DISTRICT AND COUNTY OF IMPERIAL

IMPERIAL VALLEY COLLEGE/SAN DIEGO STATE UNIVERSITY
TRANSIT STUDY
DRAFT TECHNICAL MEMORANDUM:
Executive Summary



July 2016

Prepared for:

Imperial County Transportation Commission (ICTC)
Southern California Association of Governments (SCAG)



Prepared by:

AECOM

AECOM

Contents

1.0	Introduction	1
2.0	Review of Public Input Process	2
3.0	Phased Implementation of Recommended Plan	5
4.0	Estimated Impacts of Recommended Plan	13
5.0	Greenhouse Gas Emissions Analysis	15
6.0	Summary	17

1.0 INTRODUCTION

Three of the college campuses in the Imperial Valley – Imperial Valley College (IVC) near the City of Imperial, and San Diego State University-Imperial Valley (SDSU-IV) with campuses in both Calexico and Brawley – have decided to pursue the development of a potential shuttle service linking the three facilities.

The IVC campus near the City of Imperial is currently served by several Imperial Valley Transit (IV Transit) routes. The SDSU-IV Calexico campus is not directly served by transit, although several IV Transit routes operate within walking distance. The SDSU-IV Brawley campus is currently unserved by transit.

The purpose of the Campus Transit Study is to recommend transit access improvements to and between the three campuses. These improvements may include creating a new dedicated transit service that serves the colleges and/or leveraging existing bus service.

This study is a collaborative effort between the Imperial County Transportation Commission (ICTC), Imperial Valley College (IVC), San Diego State University – Imperial Valley (SDSU-IV) and the Southern California Association of Governments (SCAG).

This Executive Summary describes the public outreach effort that informed the planning process throughout this study, as well as the phased implementation plan for a recommended set of services that serve all of these campuses.

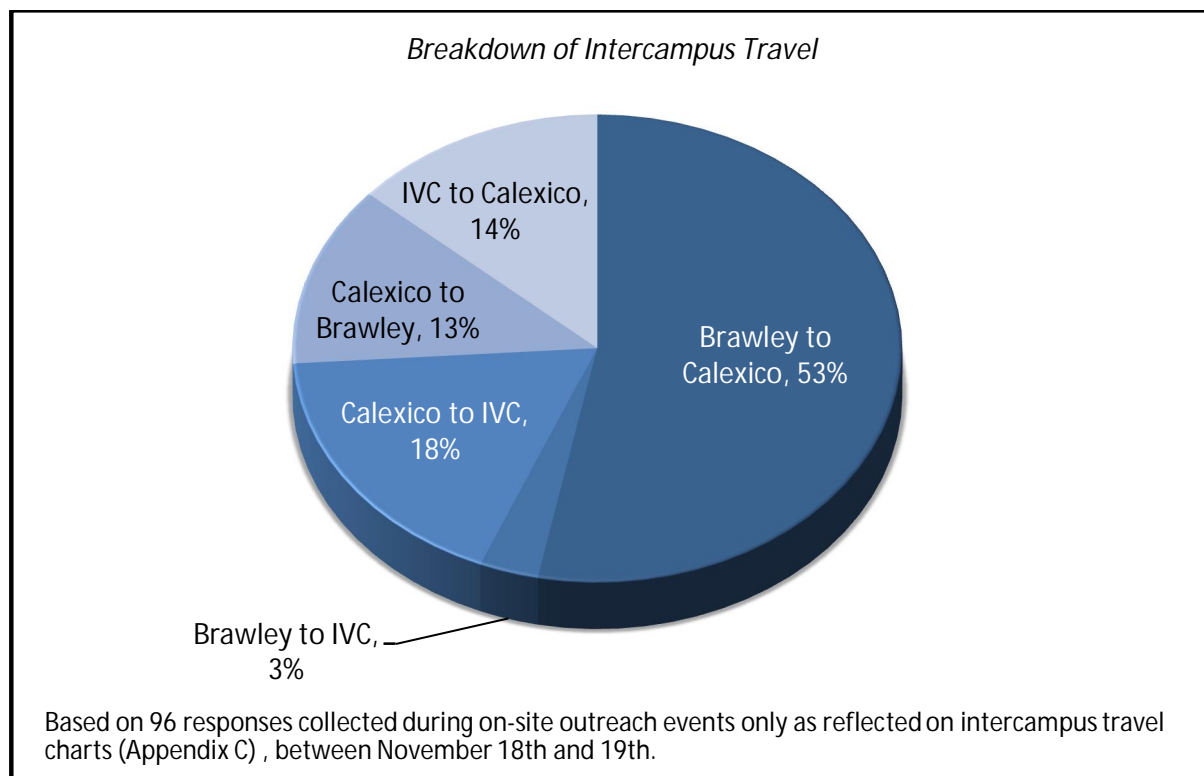
2.0 REVIEW OF PUBLIC INPUT PROCESS

Two rounds of public outreach activities took place for the Campus Transit Study. Initial public outreach efforts took place in November 2015, and gathered focused input from over 300 participants on intercampus travel patterns, student ridership, and other information to provide guidance on transit improvements. Based on initial public input, transit alternatives were developed to suite popular interests.

The second round of public outreach activities took place in April 2016, where transit alternatives were presented to the college communities. More than 100 people participated in the outreach activities to review transit alternatives and provide input to refine and prioritize the alternatives.

First Round of Outreach

According to the intercampus travel charts, trips starting from SDSU-Brawley and ending at SDSU-Calexico were most common, accounting for roughly 53%, followed by trips between SDSU-Calexico and IVC (roughly one-third).



Of the most common intercampus trips documented by participants, travel from SDSU-Brawley to SDSU-Calexico was most frequent during the afternoon (roughly 38% of participants' intercampus trips), followed by IVC to SDSU-Calexico in the afternoon (13%) and SDSU-Brawley to SDSU Calexico in the evening (12%).

The following main trends were revealed:

- Over 90% of questionnaire respondents want bus service between the college campuses.
- Current IV Transit ridership within the sampled college communities is around 19%
- Driving (74%) was identified as the main reason for not taking IV Transit, while bus fares were not viewed as a barrier to taking transit.
- 42% of questionnaire respondents attend two college campuses, while nearly 7% attend all three, collectively comprising a total of 49% of the respondents currently having intercampus commutes.
- Nearly all survey respondents were students (98%), with little participation by instructors and staff.
- 21% of the questionnaire respondents were currently cross-enrolled between SDSU-Imperial Valley and IVC.

Table 1 – Breakdown of Intercampus Travel by Time of Day

FROM > TO	Morning	Afternoon	Evening
Brawley > Calexico	4%	38%	11%
Brawley > IVC	0%	2%	1%
Calexico > Brawley	0%	5%	7%
Calexico > IVC	4%	5%	8%
IVC > Brawley	0%	0%	0%
IVC > Calexico	0%	13%	1%

Frequency	
	0% - 5%
	5.01% - 10%
	10.01% +

Second Round of Outreach

Nearly 500 sticker dots were placed on all the boards from the outreach events, amongst a total of 118 participants. The table below provides the percentage breakdowns of participants' votes for preferred service alternatives based on the alternative routes and services that were presented.

Over 50% of the participants were in favor of "Option A" (where IVC serves as a transfer point with buses circulating from SDSU-Brawley to IVC and SDSU-Calexico to IVC). "Option C" was also highly favorable amongst participants with approximately 27% of the votes.

Table 2 – Breakdown of Service Route Preferences based on Participants’ Votes

Campus	A	B	C	D	Participants Per Event
IVC Bus Stop	57.3%	7.3%	21.9%	13.5%	24
IVC Bldg 2700	50.4%	7.2%	31.1%	11.4%	66
SDSU-Brawley Lobby	25.0%	43.8%	18.8%	12.5%	4
SDSU-Calexico Quad	51.0%	19.8%	22.9%	6.3%	24
	51.1%	11.0%	27.1%	10.8%	118

Some comments specific to alternative services were as follows:

Option A:

- The level of ideal service frequency suggested by participants widely varied to include 30 minute, 45 minute, and 2 to 3 hour intervals between buses.
- Frequent service every 30 to 45 minutes seemed to align with preferences for flexibility in schedules (based on school and work).
- It was noted by several participants that the service provided in Option A could exist with some adjustments to current transit routes.

Option B:

- The start times of 10:30AM and noon were suggested by participants since IVUP students have morning classes at SDSU-Calexico.

Option C:

- Service frequency suggestions were recommended for every 2, 2 ½, and 3 hours.
- Extended service hours for later return times ranged between 7PM and 10PM to be on the safe side for those wanting to take late-afternoon classes, attend group meetings, and/or participate in on-campus events at SDSU’s main campus in San Diego.

Option D:

- Service frequency suggestions were recommended for every 1 or 2 hours.

Participants noted that Options C and D may be expensive to implement and operate, but provides a greatly needed service in the long-run due to the connections between the three college campuses and SDSU in San Diego, and NAU-Yuma.

3.0 PHASED IMPLEMENTATION OF RECOMMENDED PLAN

Several route and service alternatives were developed that would connect the three campuses – Imperial Valley College (IVC) and the San Diego State University (SDSU) – Imperial Valley satellite campuses in Calexico (SDSU-Calexico) and Brawley (SDSU-Brawley).

After a screening process, some of the route and service alternatives were eliminated from further consideration. The remaining route and service alternatives were then developed into a recommended plan, which is presented here. This recommended plan of services is also presented with its implementation phases, so as to allow for this new service in the Imperial Valley to be implemented gradually, as funding becomes available.

The phased implementation process for the recommended plan is as follows:

Phase 1 – Implement IVC Transfer Concept

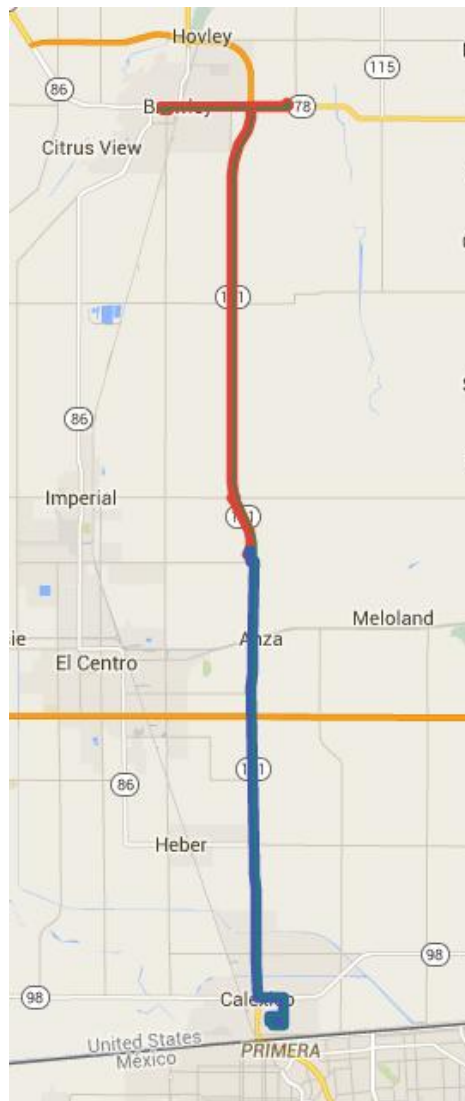
This initial phase is expected to be implemented between 2017 and 2025. With this phase, the IVC/SDSU-Calexico and IVC/SDSU-Brawley Shuttle Routes will be implemented, thus connecting the IVC campus with both of the SDSU campuses.

However, as has been previously noted, a person wishing to travel between the SDSU campuses will need to transfer at IVC, which will function as a “hub” for the shuttle system. Phase 1 is illustrated in Figure 1.

The service plan for Phase 1 is as follows:

- SDSU-Brawley/IVC Route is estimated to require approximately 60 minutes cycle time, and would utilize 1 bus to provide a 60 minute frequency of service
 - Service would operate from approximately 12:00PM to 10:30PM when school is in session
 - Would serve the IVC campus, the South Plaza transit center in Brawley and the SDSU-Brawley campus
- SDSU-Calexico/IVC Route is also estimated to require approximately 60 minutes cycle time, and would also utilize 1 bus to provide a 60 minute frequency of service
 - Service would operate from approximately 6:00AM to 10:30PM when school is in session
 - Would serve the IVC campus and the SDSU-Calexico campus

Figure 1 – Phase 1 Service – IVC Transfer Concept



Phase 2 – Implement SDSU Express Shuttle Route In Addition to IVC Transfer Concept

The second (and final) phase is expected to be implemented between 2020 and 2028. With this phase, the IVC/SDSU-Calexico and IVC/SDSU-Brawley Shuttle Routes will be complemented by the implementation of the SDSU Express Shuttle Route, which operates “express” between the two SDSU campuses.

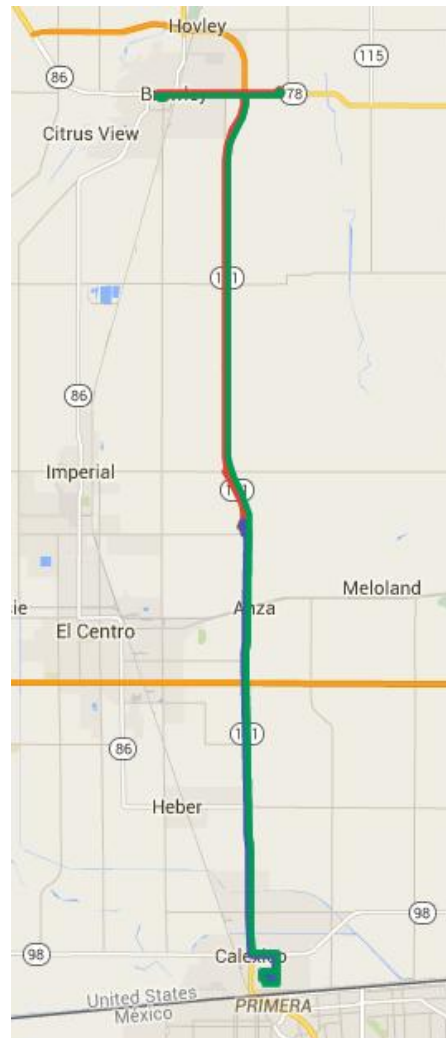
This service pattern allows any passenger traveling between any campus to have a “one seat ride” that does not require a transfer. Phase 2 is illustrated in Figure 2.

The service plan for Phase 2 is as follows:

- SDSU-Brawley/IVC Route is estimated to require approximately 60 minutes cycle time, and would utilize 1 bus to provide a 60 minute frequency of service
 - Service would operate from approximately 12:00PM to 10:30PM when school is in session

- Would serve the IVC campus, the South Plaza transit center in Brawley and the SDSU-Brawley campus
- SDSU-Calexico/IVC Route is also estimated to require approximately 60 minutes cycle time, and would also utilize 1 bus to provide a 60 minute frequency of service
 - Service would operate from approximately 6:00AM to 10:30PM when school is in session
 - Would serve the IVC campus and the SDSU-Calexico campus
- SDSU-Calexico/SDSU-Brawley Express Route is estimated to require approximately 90 minutes cycle time, and would utilize 1 bus to provide a 90 minute frequency of service
 - Service would operate from approximately 12:00PM to 10:30PM when school is in session
 - Would serve the SDSU-Calexico campus, the South Plaza transit center in Brawley and the SDSU-Brawley campus

Figure 2 – Phase 2 Service – Implement SDSU Express Shuttle Route



Longer Term Phases

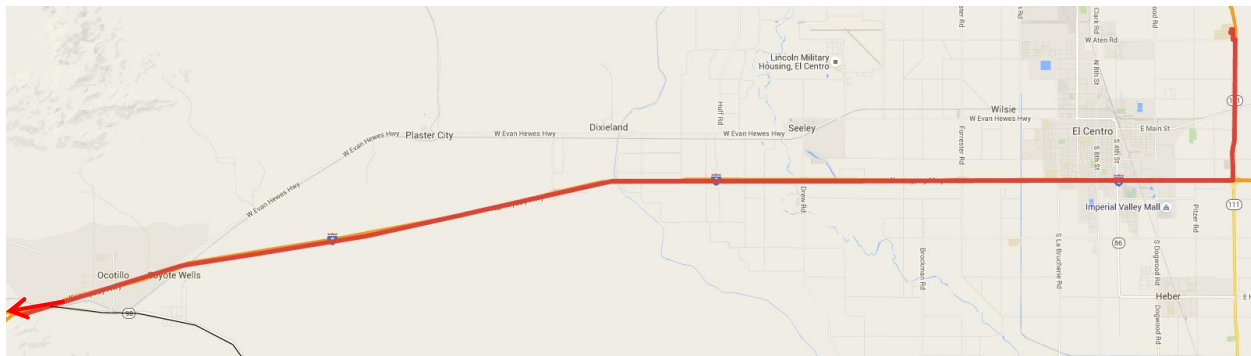
As was discussed in a prior section of the report, there are several service options which do not fit the current funding structure for providing public transportation services in the Imperial Valley, and thus would be implemented in the “longer term” (i.e., at some point after the completion of Phase 2). These phases serve locations outside of Imperial County, and as such extra-jurisdictional services fall outside the normal funding mechanisms utilized by the Imperial County Transportation Commission.

No detailed metrics beyond those utilized to estimate operating costs (and presented in a prior section of the report) were developed for these services. Nonetheless, the potential exists to operate these services in the longer term, depending on the ability to obtain additional funding from sources that may, for example, include the academic institutions.

The potential longer term phases are as follows:

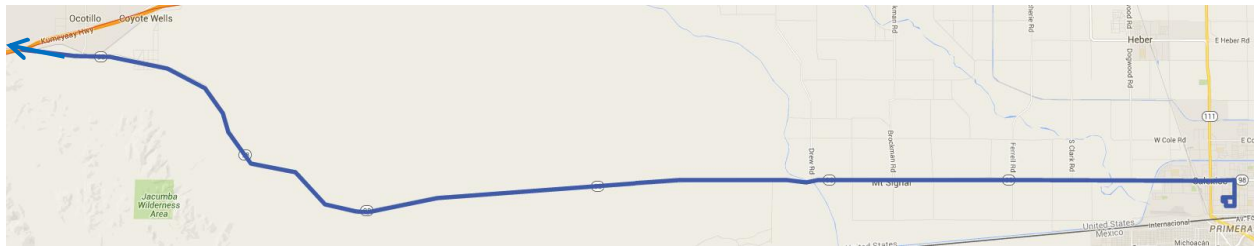
- Phase 3 – Implement SDSU Main Campus Service – In this longer-term phase, shown in Figure 3, service would be provided between the IVC campus and the SDSU Main Campus in San Diego primarily via Interstate 8.

Figure 3 – SDSU Main Campus Service from IVC



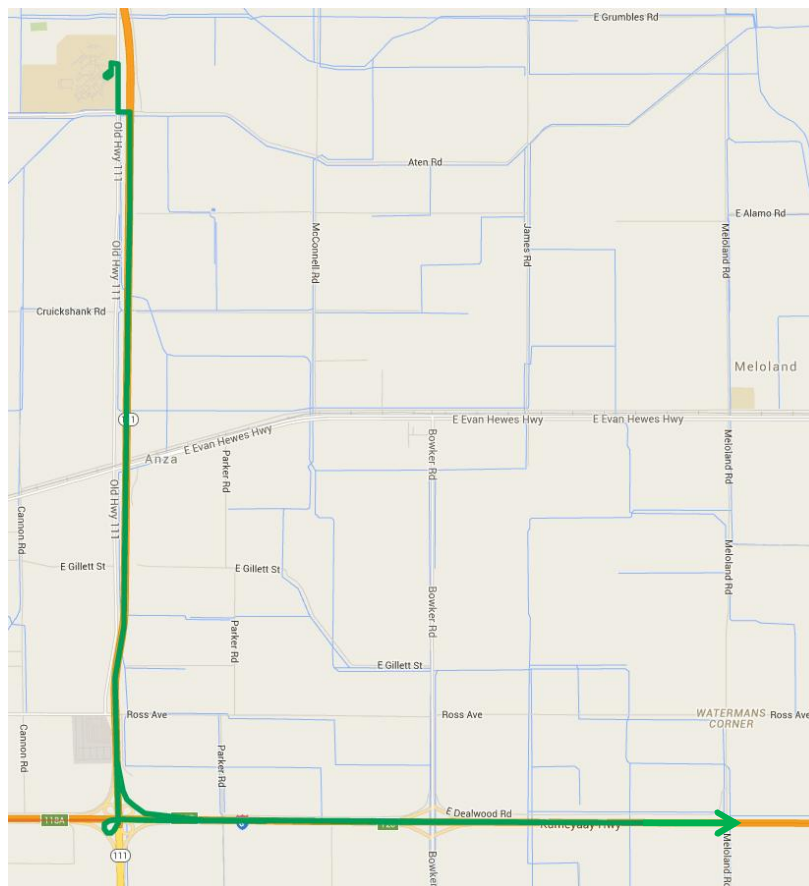
- Alternative Phase 3 – Implement SDSU Main Campus Service from SDSU-Calexico – As the option presented previously requires SDSU-Calexico students to first travel to or from IVC in order to travel to or from the SDSU Main Campus, an alternative option would instead provide the SDSU Main Campus service from SDSU-Calexico, as shown in Figure 4. This service would operate via State Route 98 (in Imperial County) and Interstate 8.

Figure 4 – SDSU Main Campus Service from SDSU-Calexico



- Phase 4 – Implement Northern Arizona University (NAU) Yuma Campus Service – In this ultimate longer term option, service would be provided between the IVC campus and the NAU Yuma Campus (primarily via Interstate 8), as shown in Figure 5.

Figure 5 – NAU Yuma Campus Service

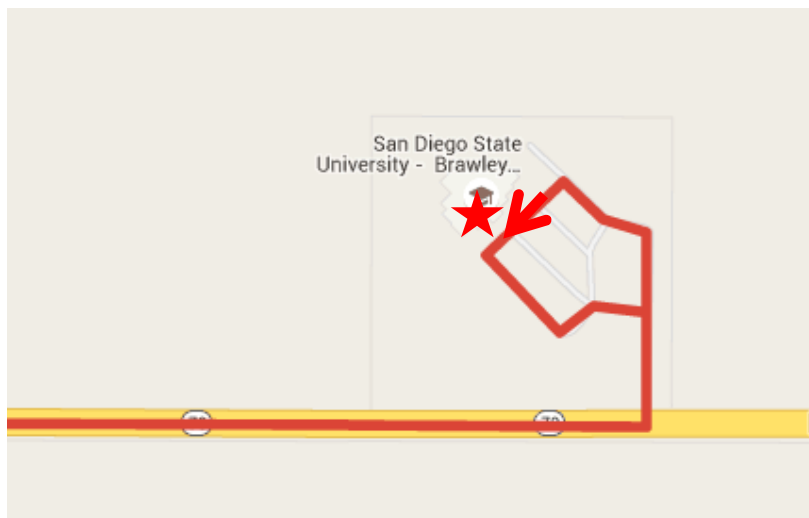


Bus Stop Locations

In addition to utilizing the existing bus stops at the IVC campus and at the South Plaza transit center in Brawley, the proposed shuttle service alternatives would also use new bus stops at the SDSU-Brawley and SDSU-Calexico campuses.

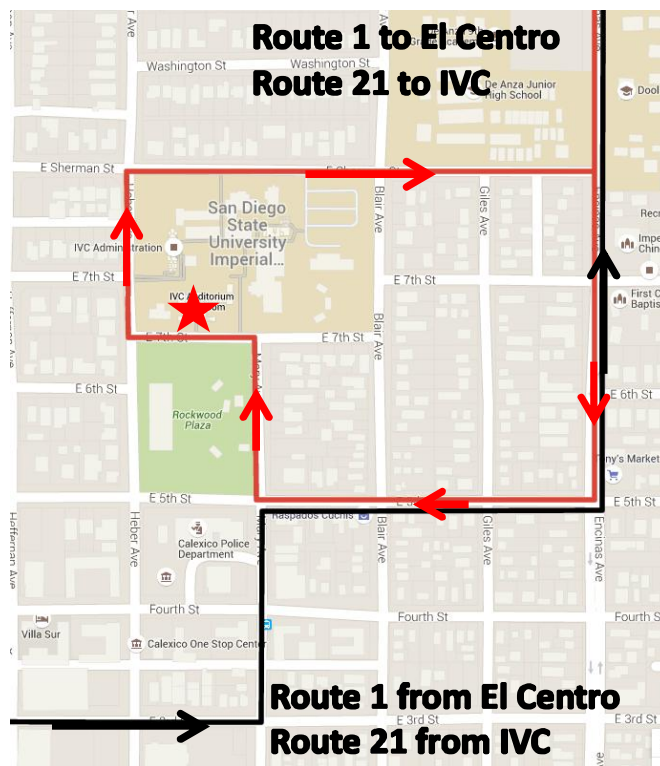
At the SDSU-Brawley campus, the new bus stop would be located along the front of the classroom building, as indicated by the star shown in Figure 6.

Figure 6 – New SDSU-Brawley Bus Stop Location



As was previously mentioned in the Existing Condition section of the report, the SDSU-Calexico campus is not directly served by the IV Transit system; however, several IV Transit routes are within walking distance. At the SDSU-Calexico campus, the new bus stop would be located along East 7th Street at the “main entrance” to the campus, as indicated by the star shown in Figure 7. Also shown are the existing IV Transit routes in the area.

Figure 7 – New SDSU-Calexico Bus Stop Location



It is assumed that each of the new bus stops would be equipped with a passenger waiting shelter as well as benches. The appropriate signage and trash containers will also be provided. It assumed – for the planning purposes of this study – that SDSU will maintain the two new bus stops, as they will be directly serving its facilities.

Vehicle Number and Type

The service plan described above would require two vehicles in Phase 1 and three vehicles in Phase 2. With the need for a spare vehicle, this means that a total of three vehicles in Phase 1 and four vehicles in Phase 2 would be required to provide the recommended level of service.

It was determined that a standard transit bus – most likely in a 35 foot length – be recommended to provide the academic shuttle service in the Imperial Valley. A standard transit bus is shown in Figure 8. Although various factors were considered, the following were especially pertinent:

- Retains a level of commonality and interoperability with the existing fleet (and therefore to likely reduce life cycle maintenance costs);
- Standard transit bus frames typically have the most options available in terms of alternative powerplants and fuel sources, which will allow for the most flexibility in selecting an alternative fuel bus for the service (and which will be discussed in a subsequent section of the report); and
- The size of a standard transit bus would mean that should higher loads occur at particular times of day or on a certain repeating basis, a more comfortable ride along State Route 111 would be provided as more passengers would be likely to obtain a seat.

Figure 8 – Standard Transit Bus



Other Transit Considerations

There are several additional transit planning considerations that should be explicitly described as part of this recommended plan. These are as follows:

- **Ridership Eligibility** – Throughout this report, it has been assumed that the Imperial County Transportation Commission would administer this academic shuttle service, and – most likely – integrate it into the existing IV Transit service (whether via the existing contract operator or by another contractor). If this service is to be part of the IV Transit system, then it must be available to the general public and not solely to members of the academic community.
- **Stopping Pattern** – It is assumed that the routes described in this recommended plan will only stop at the bus stops described in the route descriptions previously stated. Therefore, the shuttle services will provide an express “closed door” bus service between stops, and not make any additional stops.
- **Fare/Transfer Policy** – It is assumed that integration with the existing IV Transit fare structure will be undertaken in order to maximize convenience and increase potential ridership. In addition, this allows for no “fare advantage” to using any of the new shuttle routes as opposed to the existing IV Transit services.
- **Branding** – All three of the new shuttle services described in this recommended plan will be branded as the *“Imperial Valley University Transit Shuttle”*. Although it is recognized that branding such a small “sub-fleet” may create some dispatching issues for an operator, the study team determined that the benefits to a strong branding identity would allow not only the students but also the academic institutions themselves to have a stronger “sense of ownership” with regard to the service.
- **Operating/Maintenance/Storage Facility Considerations** – Adding four new buses to the existing IV Transit fleet shouldn’t pose any issues with regards to the existing operating and maintenance base or its operator.

However, it should be noted that should an alternative fuel source be selected to provide this service (i.e., especially should it be one that differs from the current fuel source), then additional capital infrastructure needs may be necessary, depending upon the fuel source selected.

4.0 ESTIMATED IMPACTS OF RECOMMENDED PLAN

The recommended plan described in this section of the report was further analyzed in order to develop additional metrics by which to gauge the potential efficacy of the service plan. These included approximate estimates – for planning purposes – of total operating costs, capital costs, ridership, revenue and farebox recovery.

Annual Operating Cost Estimates

The total annual operating cost estimates are as follows:

- Phase 1
 - SDSU Brawley-IVC Route = \$248,100/year
 - SDSU Calexico-IVC Route = \$389,900/year
 - TOTAL Phase 1 Cost = \$638,000/year

- Phase 2
 - SDSU Brawley-SDSU Calexico Express = \$248,100/year
 - TOTAL Phases 1 & 2 Cost = \$886,200/year

Capital Cost Estimates

These are as follows:

- New Bus Stops = approximately \$40,000
 - This assumes a capital cost of approximately \$20,000/bus stop, with one at SDSU-Brawley and one at SDSU-Calexico.

- New standard transit buses = approximately \$3,000,000 in vehicle costs
 - This assumes a unit cost of approximately \$750,000 per bus for an alternative fuel (or electric) bus. Costs may vary; however, an examination of approximate vehicle costs appears to indicate that this assumption is appropriate for planning purposes.

 - This also assumes three vehicles are needed for revenue service by Phase 2, with an additional spare bus (i.e., utilizing a 20% spare ratio).

Annual Ridership and Revenue Estimates and Farebox Recovery Estimates

The estimated annual ridership, revenue and farebox recovery, by phase, are as follows:

- Phase 1 Estimates
 - Phase 1 Annual Ridership
 - SDSU Brawley-IVC Route = 19,000/year

- SDSU Calexico-IVC Route = 59,700/year (*approximately 30,000/year from existing IV Transit Route 21*)
- TOTAL Phase 1 Ridership = 78,700/year

- Phase 1 Annual Revenue
 - SDSU Brawley-IVC Route = \$23,700/year
 - SDSU Calexico-IVC Route = \$74,600/year
 - TOTAL Phase 1 Revenue = \$98,300/year

- Phase 1 Farebox Recovery = 15%

- Phase 2 Estimates
 - Phase 2 Annual Ridership
 - SDSU Brawley-IVC Route = 14,200/year
 - SDSU Calexico-IVC Route = 44,800/year (*approximately 30,000/year from existing IV Transit Route 21*)
 - SDSU Calexico-SDSU Brawley Express Route = 27,400/year
 - TOTAL Phase 2 Ridership = 86,400/year

 - Phase 2 Annual Revenue
 - SDSU Brawley-IVC Route = \$17,800/year
 - SDSU Calexico-IVC Route = \$56,000/year
 - SDSU Calexico-SDSU Brawley Express Route = \$34,300/year
 - TOTAL Phase 2 Revenue = \$108,100/year

 - Phase 2 Farebox Recovery = 12%

5.0 GREENHOUSE GAS EMISSIONS ANALYSIS

This section of the report summarizes the results of the greenhouse gas (GHG) emissions analysis for the proposed transit shuttle routes between Imperial Valley College (IVC) and the San Diego State University (SDSU) satellite campuses in Brawley and Calexico campuses. The recommended plan includes three potential transit routes that will be implemented in two phases from 2017 to 2028. The Imperial County Transportation Commission (ICTC), the Southern California Association of Governments (SCAG), IVC and SDSU are considering different engine and fuel types (e.g., diesel, electric, etc.) for the buses that will operate on the transit routes.

Results

The results of the emission calculations are presented in Tables 1 through 4. Table 1 presents the annual GHG emissions for the different transit fuel types for Phase 1 of the project. As shown in Table 1, diesel and CNG buses would result in the largest net increase in GHG emissions at 363 and 312 MT CO₂e per year, respectively. Electric buses would result in the lowest level of GHG emissions at 88 MT CO₂e per year.

Table 1 – Phase 1 Bus Emissions (MT CO₂e/yr)

Fuel Type	Brawley-IVC Route Emissions	Calexico-IVC Route Emissions	Total Bus Emissions
Diesel	162.41	200.65	363.06
CNG	139.54	172.40	311.94
Electric	39.57	48.89	88.46
Hydrogen	87.91	108.60	196.51

Table 2 presents the total net change in emissions for the different routes in Phase 1 based on the change in bus emissions and the corresponding VMT reduction in passenger vehicles. Consistent with the results in Table 1, electric buses would result in the most substantial reduction in GHG emissions at 196 MT CO₂e per year.

Table 2 – Phase 1 Net Change in Emissions (MT CO₂e/yr)

Fuel Type	Brawley-IVC Route	Calexico-IVC Route	Total Net Change in Emissions
Diesel	33.59	45.17	78.76
CNG	10.73	16.92	27.64
Electric	-89.25	-106.60	-195.85
Hydrogen	-40.91	-46.88	-87.79

Table 3 presents the annual GHG emissions for the different transit fuel types for Phase 2 of the project. Similar to the results of Phase 1, diesel and CNG buses would result in the largest net increase in GHG emissions. Electric buses would result in the lowest level of GHG emissions.

Table 3 – Phase 2 Bus Emissions (MT CO₂e/yr)

Fuel Type	Brawley-IVC Route	Calexico-IVC Route	SDSU Calexico-Brawley Route	Total Bus Emissions
Diesel	162.41	200.65	193.56	556.62
CNG	139.54	172.40	166.31	478.25
Electric	39.57	48.89	47.16	135.62
Hydrogen	87.84	108.52	104.69	301.06

Table 4 presents the total net change in emissions for the different routes in Phase 2 based on the change in bus emissions and the corresponding VMT reductions in passenger vehicles. Similar to Phase 1, electric buses operating in Phase 2 would result in the most substantial reduction in GHG emissions. Hydrogen buses would also result in a net reduction in GHG emissions. Diesel and CNG buses would result in an overall net increase in annual GHG emissions. Based on the overall distance, annual ridership, and vehicle trips, the SDSU-Calexico/SDSU-Brawley Route would result in a net reduction in GHG emissions for all fuel types.

Table 4 – Phase 2 Net Change in Emissions (MT CO₂e/yr)

Fuel Type	Brawley-IVC Route	Calexico-IVC Route	SDSU Calexico-Brawley Route	Total Net Change
Diesel	74.89	130.21	-93.97	111.13
CNG	52.02	101.96	-121.22	32.76
Electric	-47.95	-21.55	-240.37	-309.87
Hydrogen	0.32	38.09	-182.84	-144.43

6.0 SUMMARY

The recommended plan for the proposed academic shuttle service consists of three new routes that would be implemented over two primary phases; it is anticipated that these services would operate only during the academic year.

This recommended plan will also be evaluated as part of the upcoming Short Range Transit Plan (SRTP) to be prepared by the Imperial County Transportation Commission.