September 12, 2014

TO: Members of the MAG 9-1-1 Oversight Team

FROM: Brenda Buren, Tempe Police Department, Chair

SUBJECT: MEETING NOTIFICATION AND TRANSMITTAL OF TENTATIVE AGENDA

Meeting: 2:00 p.m.
Monday, September 22, 2014
MAG Office Building, 302 North 1st Avenue
Cottonwood Room, Second Floor
Phoenix, AZ 85003

A meeting of the MAG 9-1-1 Oversight Team has been scheduled for the time and place noted above. Please park in the garage under the building, bring your ticket, parking will be validated. Members of the Oversight Team may attend either in person or by telephone conference call. For those who purchased a transit ticket to attend the meeting, the Regional Public Transportation Authority will provide transit tickets for your trip. For those using bicycles, please lock your bicycle in the bike rack in the garage.

Pursuant to Title II of the Americans with Disabilities Act (ADA), MAG does not discriminate on the basis of disability in admissions to or participation in its public meetings. Persons with a disability may request a reasonable accommodation, such as a sign language interpreter, by contacting the MAG office. Requests should be made as early as possible to allow time to arrange the accommodation.

If you have any questions regarding the meeting, please contact Liz Graeber, 9-1-1 Administrator, at (602) 534-9775, or Nathan Pryor, MAG, at (602) 254-6300.

TENTATIVE AGENDA

COMMITTEE ACTION REQUESTED

1. Call to Order

2. Call to the Audience

   An opportunity is provided to the public to address the 9-1-1 Oversight Team on items that are not on the agenda that are within the jurisdiction of MAG, or non-action agenda items that are on the agenda for discussion or information only. Citizens will be requested not to exceed a three minute time period for their comments. A total of 15 minutes will be provided for the Call to the Audience agenda item, unless the Oversight Team requests an exception to this limit. Please note that those wishing to comment on agenda items posted for action will be provided the opportunity at the time the item is heard.

   2. Information.

3. Approval of the October 2, 2013, Meeting Minutes

   3. Review and approve the minutes of the October 2, 2013, meeting.

4. MAG FY 2016 PSAP Annual Element/Funding Request and FY 2016-2020 Equipment Program

   Each year, the MAG Public Safety Answering Point (PSAP) Managers submit inventory and upgrade requests that are used to develop a five-year equipment program that forecasts future 9-1-1 equipment needs of the region and enables MAG to provide estimates of future funding needs to the Arizona Department of Administration (ADOA). The ADOA Order of Adoption stipulates allowable funding under the Emergency Telecommunications Services Revolving Fund. On July 10, 2014, the MAG PSAP Managers recommended approval of the MAG FY 2016 PSAP Annual Element/Funding Request and FY 2016-2020 Equipment Program. The MAG 9-1-1 Oversight Team is requested to make a recommendation to the MAG Management Committee. Please refer to the enclosed material.

   4. Recommend approval of the MAG FY 2016 PSAP Annual Element/Funding Request and FY 2016-2020 Equipment Program.

5. Pilot Program to Co-Locate Department of Public Safety Officers in the Arizona Department of Transportation Traffic Operations Center

   5. Information and discussion.

On August 27, 2014, the MAG Regional Council approved a pilot program that would co-locate Department of Public Safety (DPS) officers in the ADOT Traffic Operations Center. This three-year pilot project will station three DPS officers (three eight-hour shifts) and one DPS supervisor at the Traffic Operations Center, along with a workstation with Computer Aided Dispatch. It is anticipated that this co-location would lead to improved coordination between ADOT freeway operations and DPS traffic incident management, enabling rapid responses to major traffic incidents including crashes and wrong-way drivers.

6. Community Emergency Notification System Update

   An update will be provided on the status of the Community Emergency Notification System (CENS).

   6. Information and discussion.

7. Service Contract for 9-1-1

   The State 9-1-1 Office is proposing that the funding model for 9-1-1 services and equipment change to a bundled monthly fee. The monthly fee would include 9-1-1 equipment, 9-1-1 maintenance, and 9-1-1 networking costs. The MAG 9-1-1 Oversight Team will be briefed on this new model and its impact to the region. Please refer to the enclosed material.

   7. Information, discussion, and possible action.

8. Request for Future Agenda Items

   Topics or issues of interest that the committee would like to discuss or present at the next meeting will be requested.

   8. Information and discussion.

9. Comments from the Committee

   An opportunity will be provided for committee members to present a brief summary of current events. The Oversight Team is not allowed to propose, discuss, deliberate or take action at the meeting on any matter in the summary, unless the specific matter is properly noticed for legal action.

   9. Information.

Adjournment

MINUTES OF THE
MAG 9-1-1 OVERSIGHT TEAM MEETING
October 2, 2013
MAG Office Building, Cottonwood Room
Phoenix, Arizona

MEMBERS ATTENDING

Brenda Buren, Tempe Police Department, Chair
Jay Strebeck, Phoenix Fire Department
Vice Chair
Chuck Jenkins for Mark Burdick, Glendale Fire Department
* Vacant, Maricopa County Sheriff's Office
Bruce McGregor for Harry Beck, Mesa Fire Department
* Rocky Smith, Peoria Police Department
# Jesse Cooper for Phoenix Police Department
Burl Haenel for John Cocca, Scottsdale Police Department
Lawrence Rodriguez, Tolleson Police Department, Past Chair

* Those members neither present nor represented by proxy.
# Attended by telephone conference call. + Attended by videoconference call.

OTHERS PRESENT

Kasey Beal, Mesa
Valerie Day, MAG
Sheri Gibbons, Gilbert
Liz Graeber, MR 9-1-1 Administrator
Barbara Jaeger, ADOA
Nathan Pryor, MAG

1. Call to Order

The meeting of the MAG 9-1-1 Oversight Team was called to order by Chair Brenda Buren, Tempe Police Department, at 2:00 p.m. Chuck Jenkins, as proxy for Mark Burdick, and Jesse Cooper attended the meeting by teleconference. Self introductions followed.

2. Call to the Audience

An opportunity is provided to the public to address the 9-1-1 Oversight Team on items that are not on the agenda that are within the jurisdiction of MAG, or non-action agenda items that are on the agenda for discussion or information only. Citizens will be requested not to exceed a three minute time period for their comments. A total of 15 minutes will be provided for the Call to the Audience agenda item, unless the Oversight Team requests an exception to this limit. Opportunities for comment on items posted for action are provided at the time the item is heard.

Chair Buren noted that no public comment cards had been received.

3. Approval of the September 12, 2012, Meeting Minutes

Chief Larry Rodgriguez moved approval of the minutes of the September 12, 2012, meeting, as written. Commander Burl Haenel seconded, and the motion passed unanimously.

4. MAG FY 2015 PSAP Annual Element/Funding Request and FY 2015-2019 Equipment Program

Each year, the MAG Public Safety Answering Point (PSAP) Managers submit inventory and upgrade requests that are used to develop a five-year equipment program that forecasts future 9-1-1 equipment needs of the region and enables MAG to provide estimates of future funding needs to the Arizona Department of Administration (ADOA). The ADOA Order of Adoption stipulates allowable funding under the Emergency Telecommunications Services Revolving Fund. On July 11, 2013, the MAG PSAP Managers recommended approval of the MAG FY 2015 PSAP Annual Element/Funding Request and FY 2015-2019 Equipment Program. The MAG 9-1-1 Oversight Team was requested to make a recommendation to the MAG Management Committee.

Liz Graeber, MAG 9-1-1 Administrator, reported on the Fiscal Year 2015 budget. She noted that the total is $15,185,758, which includes wireline and wireless network costs, maintenance for the 25 PSAP centers, the two network centers, and equipment upgrades. Ms. Graeber stated that the projects requests total $5,000,000 and include a logging recorder at DPS, two positions and a logging recorder at Mesa Fire, a system upgrade at Phoenix Police, a logging recorder at Scottsdale Police, and a system upgrade at Tempe Police.

Ms. Graeber stated that due to funding limitations, the State 9-1-1 Office has notified MAG that it can no longer cover reimbursements for logging recorders or additional positions, and upgrades are done on a per site basis. She said that the PSAPs have been informed of this, however, the PSAP requests are still taken through the MAG approval process and submitted to the State, per the usual practice.

Chair Buren asked Ms. Graeber to describe the budget process at the State. Ms. Graeber explained that after the PSAP equipment requests are recommended for approval through the MAG committee process with approval by the Regional Council, they are submitted to the State 9-1-1 Office by December 15. She said that the State 9-1-1 Office then processes a report that is submitted to the Joint Legislative Budget Committee. Ms. Graeber stated that the MAG 9-1-1 Office is then notified in the May/June 2014 timeframe items that will be funded for 2015.

Jesse Cooper asked for clarification of the Phoenix upgrades to Lifeline equipment. Ms. Graeber replied that Lifeline equipment would be replaced at both Phoenix sites.

Chair Buren asked for clarification of funding limitations. Ms. Graeber replied that collections of the monthly 9-1-1 tax are sufficient to cover only the maintenance and network costs, with a small amount left over. She said that due to a lower balance of the 9-1-1 fund, the State had to prioritize expenditures and end-of-life equipment replacements would be a priority over extra positions or logging recorders.

Chair Buren noted that no public comment cards had been received. She called for a motion.

Chief Rodriguez moved to recommend approval of the MAG FY 2015 PSAP Annual Element/Funding Request and FY 2015-2019 Equipment Program. Vice Chair Strebeck seconded, and the motion passed unanimously.

5. Text to 9-1-1 Proposals

Ms. Graeber reported that the Federal Communications (FCC) is moving toward delivery of IP or digital information to 9-1-1. She said the FCC has not mandated the change, it proposed three options. Ms. Graeber stated that on July 11, 2013, the MAG PSAP Managers discussed the three options proposed by the FCC and recommended Option 1, which is the Next Generation 9-1-1 version as the most appropriate path for Maricopa Region 9-1-1.

Ms. Graeber summarized Option 1: A PSAP would wait until it has Next Generation services, which means it has 9-1-1 trunks that run across an IP platform. She added that the PSAP would have the ability to handle the information through its call taking equipment.

Ms. Graeber summarized Option 2: A web-based solution requiring PSAPs to have a computer connected to the Internet that would require constant monitoring. The PSAPs did not favor this option because staff would need to monitor the computer for messages constantly.

Ms. Graeber summarized Option 3: TTY (the component currently used for hearing impaired). She explained that with some modification, this option would allow text to be translated into TTY. Ms. Graeber stated that this was viewed by the PSAPs as the least favorable option due to questionable quality.

Ms. Graeber stated that the PSAPs supported the idea of Option 1 and waiting for implementation until they have IP-based infrastructure capable of handling text and digital communications.

Chair Buren asked the timeframe for the implementation. Ms. Graeber replied that implementation in the nation is going on now and some sites are live. She said that Blackhawk, Iowa, was the first PSAP to receive text to 9-1-1 messages. Ms. Graeber explained that Blackhawk was chosen as a test site because it has only one carrier. She noted that the state of Vermont and Raleigh/Durham, North Carolina have implemented text to 9-1-1, and implementation in the state of Washington is in process.

Ms. Graeber reported that lack of funding is holding back Arizona from implementing text to 9-1-1. She said MAG 9-1-1 has been preparing for IP-based equipment, but the development of IP-based infrastructure will take money. With the funds being swept from the state 9-1-1 fund, any money available is gone, and so a funding model based on a per seat fee is being proposed. Ms. Graeber stated that the funding model being proposed by CenturyLink is $2,000 per position per month. She said it would include the network and equipment.

Chair Buren asked if implementation would be by region or by agency. Ms. Graeber replied that due to the size of the region, implementation would need to take place PSAP by PSAP. Ms. Graeber stated that 13 of the region's PSAPs have Viper equipment that is IP-based and allows receiving

digital information. She added that implementation in the MAG region would be a matter of upgrading the equipment and readying the network to receive Next Generation communications.

Nathan Pryor, MAG staff, noted that one important element is the implications of the proposed change by CenturyLink are unknown and will be discussed further with the State. He noted that this could result in the need to update the Oversight Team when new information is available.

Chief Rodriguez asked for clarification the PSAP Managers recommended Option 1. Ms. Graeber replied that was correct.

Chair Buren commented that this will be an interesting process as it moves forward.

Commander Haenel moved to recommend approval of Option 1. Chief Rodriguez said that he would second the motion but would like to ask if the vote should be taken now or postponed until the implications of CenturyLink were known.

Ms. Graeber stated that what is being proposed is only a recommendation on the technology that will be used to receive text to 9-1-1. She said that the funding is a separate issue and will need to be addressed separately at a later date. Ms. Graeber explained that the cities will need to cover those extra costs if the Legislature allocates any more of the state 9-1-1 fund.

Chair Buren asked for clarification that the financial model was not dependent on the technical model. Ms. Graeber replied that was correct.

With no further questions, the vote on the motion passed unanimously.

6. Community Emergency Notification System Update

Ms. Graeber updated the Oversight Team on the Community Emergency Notification System (CENS). She said that as of September 30 in this calendar year, CENS had been launched 68 times. Ms. Graeber noted that this is ahead of last year's rate – a total of 68 launches was not reached until December. She expressed that it was gratifying that agencies are getting value from the system and activations justify the cost. Ms. Graeber stated that they are looking at upgrading the system. She said they are not looking to change anything until they can find out if IPAWS will allow selective notifications. Ms. Graeber explained that currently, IPAWS provides weather updates through smartphones to all or nothing. When that is upgraded they will include it in CENS launches. Ms. Graeber stated that the vendor is working on this, but in the meantime, MAG 9-1-1 will continue to use its current product.

Chair Buren asked for clarification of the financial component of CENS and what it would be if upgraded.

Ms. Graeber stated that there are three areas where there is a cost. 1) The calling platform of 137 telephone lines. 2) Vendor support. 3) Hardware/equipment at each of the 25 9-1-1 centers. Ms. Graeber stated that these costs total approximately $80,000 per year.

Commander Haenel asked for clarification of per call costs. Ms. Graeber replied that there is no per-call cost if only the 137 lines are used, but if a large notification in a short period of time is needed and the mass callout feature is used, the cost is 20 cents per minute per answered call. She added that this charge is passed on to the PSAP. Ms. Graeber said that the mass callout will notify 50,000 people in 15 minutes, but on average, CENS notifications have been less than 5,000, and the mass callout is not needed. She added that 100,000 calls through the CENS platform of 137 lines would take 24 hours of non-stop calling. Ms. Graeber noted that the CENS update is a regular item on the Oversight Team agendas and she would keep the committee informed.

Commander Cooper asked about Homeland Security funding for CENS. Ms. Graeber replied that Homeland Security funds CENS. She said that the State Homeland Security committee holds CENS in higher favor because it is offered as a regional tool available to both police and fire departments. Ms. Graeber remarked that the State Homeland Security committee has informed MAG 9-1-1 that the Homeland Security funds have been decreasing each year and as a result, a permanent funding source is going to be needed. Ms. Graeber stated that CENS has Homeland Security funding for 12 months, and then there are some additional funds that could extend funding CENS for an additional year. She advised that if Homeland Security funds cease, a permanent funding source for CENS would be needed. Ms. Graeber stated that MAG 9-1-1 has submitted a funding request for CENS through the State 9-1-1 Office, but it has no funds available for this type of program.

7. Update on New MAG Member Agencies and the MAG Region 9-1-1 System

Ms. Graeber reported that some jurisdictions in Pinal County are a part of the Maricopa Region 9-1-1 area, such as Apache Junction, Queen Creek, and Gold Canyon Ranch. She noted that approximately one year ago, the Town of Buckeye began dispatching for the City of Maricopa. Ms. Graeber added that the City of Maricopa and the Town of Florence recently become MAG member agencies, however, Florence remains in the Pinal County 9-1-1 system, which makes sense for them in regard to budgeting.

Nathan Pryor, MAG staff, provided background on the reason membership was given to Maricopa and Florence. He explained that MAG is the metropolitan planning organization for this region. The ten year census looked at the contiguous urbanized area and recognized the growth that occurred to the south of the MAG region. Mr. Pryor noted that Pinal County, Maricopa and Florence passed Resolutions to join MAG and they became members this year. He advised that this does not mean that Florence and Pinal County will be members of Maricopa Region 9-1-1 and will remain in the Pinal County 9-1-1 system.

Chair Buren asked if this would impact the funding allocation. Ms. Graeber replied that it had no impact on the current budget, but if Florence would have wanted to join the Maricopa Region 9-1-1 system, it would have been a difficult process to extract it from the Pinal County 9-1-1 system and include it in the Maricopa Region 9-1-1 system. Ms. Graeber stated that the City of Maricopa does not have its own 9-1-1 center because Buckeye does its dispatching, but Florence does have its own center and positions. She remarked that providing maintenance to Florence could be difficult due to its distance.

Chair Buren asked about funding impacts resulting from the City of Maricopa. Ms. Graeber replied that the City of Maricopa positions were already at the Town of Buckeye.

8. Request for Future Agenda Items

Topics or issues of interest that the committee would like to discuss or present at the next meeting will be requested.

Chair Buren asked if the information on Next Generation 9-1-1 would be available in order to have a meeting in November. Ms. Graeber noted that she understood the CenturyLink paperwork had not gone to the state 9-1-1 office yet. She suggested the Oversight Team meet after that occurred.

Chair Buren suggested a discussion of new 9-1-1 technology. Ms. Graeber noted that this topic also could be discussed at the PSAP Managers Group meeting.

Chair Buren stated that one of the automobile providers has instant messaging capabilities to 9-1-1, which could have impacts to the MAG 9-1-1 system. She said that a report for information and discussion could be provided.

No other requests were noted.

9. Comments from the Committee

An opportunity was provided for committee members to present a brief summary of current events. The Oversight Team is not allowed to propose, discuss, deliberate or take action at the meeting on any matter in the summary, unless the specific matter is properly noticed for legal action.

No comments from the committee were noted.

Adjournment

There being no further business, the meeting adjourned at 2:30 p.m.

Agenda Item #4

MARICOPA ASSOCIATION OF GOVERNMENTS INFORMATION SUMMARY… for your review

DATE:
September 12, 2014

SUBJECT:
MAG FY 2016 PSAP Annual Element/Funding Request and FY 2016-2020 Equipment Program

SUMMARY:
Each year, the Public Safety Answering Point (PSAP) Managers submit inventory and upgrade requests that are used to develop a five-year equipment program that forecasts future 9-1-1 equipment needs of the region and will enable MAG to provide estimates of future funding needs to the Arizona Department of Administration (ADOA). The funding request for FY 2016 is required to be submitted to the ADOA by December 15, 2014.

The ADOA Order of Adoption stipulates allowable funding under the Emergency Telecommunications Services Revolving Fund. The Emergency Telecommunications Services Revolving Fund is funded by the monthly 9-1-1 excise tax on wireline and wireless telephones. The 9-1-1 excise tax is currently 20 cents per month, which is the lowest monthly 9-1-1 collection in the United States. The State 9-1-1 Office has determined that sufficient revenue will be collected to allow for continued network and equipment maintenance services, but no capital expenditures to replace aging 9-1-1 will be funded until near the end of the fiscal year when budget overages are determined. The State 9-1-1 Office has indicated the 9-1-1 funds will not cover reimbursements for logging recorders, additional 9-1-1 call taking positions, and funding new PSAPs.

PUBLIC INPUT:
None.

PROS & CONS:
PROS: The five-year equipment program assists the MAG 9-1-1 Oversight Team to forecast future equipment needs of the region and will enable MAG to provide estimates regarding future funding needs to ADOA.

CONS: None.

TECHNICAL & POLICY IMPLICATIONS:
TECHNICAL: None.

POLICY: The process for approval of the PSAP funding request and five-year equipment program, which includes recommendations from the MAG 9-1-1 Oversight Team and Management Committee and approval by the Regional Council, demonstrates greater participation by management.

ACTION NEEDED:
Recommend approval of the MAG FY 2016 PSAP Annual Element/Funding Request and FY 2016-2020 Equipment Program.

PRIOR COMMITTEE ACTIONS:

MAG 9-1-1 PSAP Managers Group: On July 10, 2014, the MAG 9-1-1 PSAP Managers Group recommended approval of the MAG FY 2016 PSAP Annual Element/Funding Request and FY 2016-2020 Equipment Program.

MEMBERS ATTENDING

Cari Zanella, Mesa Police Department, Chair
Domela Finnessey, Surprise Police Department, Vice Chair
* Lisa Eminhizer, Apache Junction Police Department
\# Mirela Borsan, Avondale Police Department
Jim Tortora, Buckeye Police Department
Michelle Potts, Chandler Police Department
* Stephanie Beebe, Ft. McDowell Yavapai Nation
\# Janet Laird, Gilbert Police Department
Loretta Hadlock, Glendale Police Department
* Chris Nadeau, Goodyear Police Department
\# Rich Johnson, Maricopa County Sheriff's Office
Michael Cole, Paradise Valley Police Department
Anje Reimer, Peoria Police Department
\# Dan McNemee, Phoenix Police Department
Rachel Harris for Curtis Thomas, Salt River Pima-Maricopa Indian Community Police Department
* Karen Sutherland, Scottsdale Police Department
Patrick Cutts, Tempe Police Department
Toni Rogers, Tolleson Police Department
Ken Lutkiewicz, Wickenburg Police Department
\+ Lonny Foster, ASU Police Department
\+ Barbara Jaeger, ADOA
\#+ Patty Simpson, DPS
*+ David Demers, Luke AFB Fire Department
\+ Doreen Wasick, Mesa Fire & Medical Department
\#+ Dori Beck, Phoenix Fire Department
\+ Ellen White, Rural Metro Fire Department/Southwest Ambulance

* Those members neither present nor represented by proxy.
\+ Ex-Officio member
\# Attended by Teleconference

CONTACT PERSON:

Liz Graeber, Phoenix Fire Department, 602-534-9775, or Nathan Pryor, MAG, 602-254-6300.

MAG FY 2015 PSAP ANNUAL ELEMENT/FUNDING REQUEST

Agenda Item #4

SYSTEM IDENTIFICATION: Maricopa Region 9-1-1
AGENCY SUBMITTING: Phoenix Fire Department
ADDRESS: 150 S. 12th St., Phoenix, AZ 85034

CONTACT: Liz Graeber
TELEPHONE #: (602) 534-9775
DATE: 24-Jun-14

Calendar Year	2015						2016					
TOTAL	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
Wireline												
Maintenance:												
$1,340,100	$111,675	$111,675	$111,675	$111,675	$111,675	$111,675	$111,675	$111,675	$111,675	$111,675	$111,675	$111,675
911 Monthly Service:												
$3,180,000	$265,000	$265,000	$265,000	$265,000	$265,000	$265,000	$265,000	$265,000	$265,000	$265,000	$265,000	$265,000
Customer Premise Equipment												
$4,225,000	$50,000	$50,000	$50,000	$4,000,000	$75,000							
Special Projects/Misc maintenance												
$201,666	$65,415	$65,415	$65,415	$65,415	$65,415	$65,415	$65,415	$65,415	$65,415	$65,415	$65,415	$65,415
Wireless												
Maintenance:												
$0												
911 Monthly Service:												
$2,419,992	$201,666	$201,666	$201,666	$201,666	$201,666	$201,666	$201,666	$201,666	$201,666	$201,666	$201,666	$201,666
Addressing/Mapping/GIS												
$44,000	$11,000			$11,000			$11,000			$11,000		
Customer Premise Equipment												
$0												
Special Projects												
$3,000,000	$2,000,000											
FY TOTALS												
$14,410,758	**$2,704,756**	**$693,756**	**$693,756**	**$4,654,756**	**$718,756**	**$643,756**	**$654,756**	**$643,756**	**$643,756**	**$654,756**	**$643,756**	**$643,756**

Equipment:

Upgrade Periphals		*50,000*
Chandler	2 positions	*50,000*
Mesa Fire	2 positions, logging recorder	*$50,000*
Phoenix PD	911 System Upgrade	*$4,000,000*
Wickenburg PD	3 positions	*$75,000*

Equipment figures are only estimates - will have preliminary quotes before submitting to ADOA

$4,225,000 **Total**

Budget table FY2016 6/26/2014

MAG FY2016-2020 PSAP Equipment Program

	FY2016	FY2017	FY2018	FY2019	FY2020
Apache Junction PD					
ASU PD					
Avondale PD					
Buckeye PD					
Chandler PD	2 additional positions	1 additional position	1 additional position	No pending projects	No pending projects
DPS					
Ft. McDowell	No pending projects	No pending projects	No pending projects	No pending projects	No pending projects
Gilbert PD	No pending projects	No pending projects	No pending projects	No pending projects	No pending projects
Glendale PD	No pending projects	No pending projects	No pending projects	No pending projects	No pending projects
Goodyear PD					
Luke AFB	No pending projects	PSAP move	No pending projects	No pending projects	No pending projects
MCSO	No pending projects	No pending projects	4 additional positions	No pending projects	No pending projects
Mesa Fire	Logging recorder, 2 additional positions	2 additional positions	No pending projects	No pending projects	No pending projects
Mesa PD	No pending projects	5 additional positions	No pending projects	No pending projects	No pending projects
Paradise Valley PD	No pending projects	No pending projects	No pending projects	No pending projects	No pending projects
Peoria PD	No pending projects	No pending projects	No pending projects	No pending projects	No pending projects
Phoenix Fire					
Phoenix PD	No pending projects	No pending projects	No pending projects	No pending projects	No pending projects
Rural Metro PD					
Salt River PD	No pending projects	No pending projects	No pending projects	No pending projects	No pending projects
Scottsdale PD	No pending projects	No pending projects	No pending projects	No pending projects	No pending projects
Surprise PD	No pending projects	No pending projects	1 additional position	No pending projects	No pending projects
Tempe PD					
Tolleson PD	No pending projects	Logging recorder	No pending projects	No pending projects	No pending projects
Wickenburg PD	3 additional positions	No pending projects	No pending projects	No pending projects	No pending projects

Chandler · Arizona
Where Values Make The Difference

Chandler
All-America City
2010

Michelle Potts
250 East Chicago Street
Chandler, AZ 85225

June 6, 2014

Liz Graeber
Maricopa Region 9-1-1 Administrator
Phoenix Fire Dept – Maricopa Region 911 Services
150 South 12th Street
Phoenix, AZ 85034

Dear Ms. Graeber:

The Chandler Police Department is in the planning stages of our second phase of the dispatch center renovation, which initially began in FY 12-13. This second phase will include the addition of four dispatch positions. Our current schedule has staffing at or exceeding our current 12 consoles at 11 hours per week. We currently have four in training and an additional four trainees scheduled to begin on 6/23/14. Fully staffed, on duty staffing would exceed our current number of consoles approximately 40 hours per week.

We are requesting the following additional consoles:

- FY 15-16: 2 positions
- FY 16-17: 1 position
- FY 17-18: 1 position

In addition, the Chandler Police Department has begun the early planning stages with the Tempe Police Department to build a joint backup dispatch and training center. Preliminary discussions include building the center on undeveloped land at the current Chandler Desert Breeze Precinct at 251 North Desert Breeze Boulevard in Chandler (between Rural and McClintock on Ray Rd). The current Chandler backup center includes two radio/CAD positions, with no phone capabilities. The equipment requirements for Chandler would be seven phone positions, which includes one supervisor, four dispatcher and two call taker positions. Chandler is also requesting a logging recorder for both Tempe and Chandler to support the equipment in this backup center.

This project is currently in the Chandler Police Department's Master Plan and is in consideration for incorporation into the City's CIP plan. There is no definitive timeline identified yet on this project. As such, it is being included in the FY 15-16 budget request.

Sincerely,

Michelle L Potts

Michelle Potts
Communications Manager
Chandler Police Department

Budget Requests for FY 2016 - FY 2020

PSAP: CHANDLER PD

Fiscal Year 2016 (July 2015-June 2016)

Budget Items

☒ **Logging recorder** - Partial reimbursement only
Include justification - age and condition of present recorder
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

Estimated # of channels _____
Estimated purchase date '15-'16

☐ **Additional positions**
Include justification - must include sample schedule that shows positions filled

How many 2 + 7/backup center

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☒ ~~PSAP move~~
Backup center- new build

Estimated date '15-'16
Possible location 251 N. Desert Breeze Blvd., Chandler

Fiscal Year 2017 (July 2016-June 2017)

Budget Items

☐ **Logging recorder** - Partial reimbursement only
Include justification - age and condition of present recorder
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

Estimated # of channels _____
Estimated purchase date _____

☒ **Additional positions**
Include justification - must include sample schedule that shows positions filled

How many 1

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move

Estimated date _____
Possible location _____

Fiscal Year 2018 (July 2017-June 2018)

Budget Items

☐ **Logging recorder** - Partial reimbursement only
Include justification - age and condition of present recorder
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

Estimated # of channels _____
Estimated purchase date _____

☒ **Additional positions**
Include justification - must include sample schedule that shows positions filled

How many 1

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move

Estimated date _____
Possible location _____

Fiscal Year 2019 (July 2018-June 2019)

Budget Items

☐ **Logging recorder** - Partial reimbursement only
Include justification - age and condition of present recorder
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

Estimated # of channels _____
Estimated purchase date _____

☐ **Additional positions**
Include justification - must include sample schedule that shows positions filled

How many _____

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move

Estimated date _____
Possible location _____

Fiscal Year 2020 (July 2019-June 2020)

Budget Items

☐ **Logging recorder** - Partial reimbursement only
Include justification - age and condition of present recorder
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

Estimated # of channels _____
Estimated purchase date _____

☐ **Additional positions**
Include justification - must include sample schedule that shows positions filled

How many _____

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move

Estimated date _____
Possible location _____

Contact: MICHELLE POTTS
Phone #: 480-782-4149
Fax #: 480-782-4155
Date: 6/6/2014

Please return to:

Liz Graeber
Phoenix Fire Dept - Maricopa Region 911 Services
150 S 12th St
Phoenix, AZ 85034
Fax: 602-495-3751
email: liz.graeber@phoenix.gov

Budget Requests for FY 2016 - FY 2020

PSAP: Fort McDowell PD

Fiscal Year 2016 (July 2015-June 2016)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____ — NOTHING AT THIS TIME
Include justification - age and condition of present recorder — Estimated purchase date _____
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____
Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____
Possible location _____

Fiscal Year 2017 (July 2016-June 2017)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____
Include justification - age and condition of present recorder — Estimated purchase date _____
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____
Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____
Possible location _____

Fiscal Year 2018 (July 2017-June 2018)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____
Include justification - age and condition of present recorder — Estimated purchase date _____
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____
Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____
Possible location _____

Fiscal Year 2019 (July 2018-June 2019)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____
Include justification - age and condition of present recorder — Estimated purchase date _____
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____
Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____
Possible location _____

Fiscal Year 2020 (July 2019-June 2020)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____
Include justification - age and condition of present recorder — Estimated purchase date _____
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____
Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____
Possible location _____

Contact: SGT STEPHANIE BEEBE
Phone #: 480-789-7517
Fax #: 480-789-7596
Date: APRIL 22, 2014

Please return to:

Liz Graeber
Phoenix Fire Dept - Maricopa Region 911 Services
150 S 12th St
Phoenix, AZ 85034
Fax: 602-495-3751
email: liz.graeber@phoenix.gov

Budget Requests for FY 2016 - FY 2020 PSAP: Gilbert Police Department

Fiscal Year 2016 (July 2015-June 2016)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2017 (July 2016-June 2017)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2018 (July 2017-June 2018)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2019 (July 2018-June 2019)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____
Include justification - age and condition of present recorder — Estimated purchase date _____
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____
Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____
Possible location _____

Fiscal Year 2020 (July 2019-June 2020)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____
Include justification - age and condition of present recorder — Estimated purchase date _____
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____
Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____
Possible location _____

Contact: Janet Laird
Phone #: 480-635-7007
Fax #: 480-503-6541
Date: May 7, 2014

Please return to:

Liz Graeber
Phoenix Fire Dept - Maricopa Region 911 Services
150 S 12th St
Phoenix, AZ 85034
Fax: 602-495-3751
email: liz.graeber@phoenix.gov

Budget Requests for FY 2016 - FY 2020

PSAP: Glendale P.D.

Fiscal Year 2016 (July 2015-June 2016)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2017 (July 2016-June 2017)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2018 (July 2017-June 2018)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2019 (July 2018-June 2019)

Budget Items

☐ **Logging recorder** - Partial reimbursement only
Include justification - age and condition of present recorder
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

Estimated # of channels _____
Estimated purchase date _____

☐ **Additional positions**
Include justification - must include sample schedule that shows positions filled

How many _____

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move

Estimated date _____
Possible location _____

Fiscal Year 2020 (July 2019-June 2020)

Budget Items

☐ **Logging recorder** - Partial reimbursement only
Include justification - age and condition of present recorder
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

Estimated # of channels _____
Estimated purchase date _____

☐ **Additional positions**
Include justification - must include sample schedule that shows positions filled

How many _____

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move

Estimated date _____
Possible location _____

Contact: Loretta Hadlock
Phone #: 623-772-7660
Fax #: 623-772-7650
Date: June 5, 2014.

Please return to:
Liz Graeber
Phoenix Fire Dept - Maricopa Region 911 Services
150 S 12th St
Phoenix, AZ 85034
Fax: 602-495-3751
email: liz.graeber@phoenix.gov

MESA REGIONAL DISPATCH CENTER
PO Box 1466
Mesa, Arizona 85211-1466

mesa-az

mesaaz.gov

To: Liz Graeber, Maricopa Region 911 Administrator

From: Doreen Wasick, Mesa regional Dispatch Center Administrator

Subject: MAG FY 2016 PSAP Equipment Funding Request and MAG FY 2016-2020 PSAP Equipment Program

The MRDC will be transitioning to a Secondary PSAP on August 18th. The MRDC currently has six fully functional dispatch consoles. With the additional call taking responsibilities the MRDC is requesting two additional call taking positions. The MRDC is currently co located with Mesa Police Public Safety Communications. The two agencies will continue to share the Mesa PSC Logging Recorder after August 18th. The MRDC would like to request a Logging Recorder dedicated to the MRDC.

Cc: Assistant Chief Cori Hayes

Fire Chief Harry Beck

480.644.4894 (tel)
480.644.5491 (fax)

Budget Requests for FY 2016 - FY 2020

PSAP: Mesa Regional Dispatch

Fiscal Year 2016 (July 2015-June 2016)

Budget Items

☒ **Logging recorder** - Partial reimbursement only
Include justification - age and condition of present recorder
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

Estimated # of channels: 10-16
Estimated purchase date: FY 2015-16

☒ **Additional positions**
Include justification - must include sample schedule that shows positions filled

How many: 2

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move

Estimated date: _____
Possible location: _____

Fiscal Year 2017 (July 2016-June 2017)

Budget Items

☒ **Logging recorder** - Partial reimbursement only
Include justification - age and condition of present recorder
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

Estimated # of channels: 10-16
Estimated purchase date: FY 16-17

☒ **Additional positions**
Include justification - must include sample schedule that shows positions filled

How many: 2

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move

Estimated date: _____
Possible location: _____

Fiscal Year 2018 (July 2017-June 2018)

Budget Items

☐ **Logging recorder** - Partial reimbursement only
Include justification - age and condition of present recorder
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

Estimated # of channels: _____
Estimated purchase date: _____

☐ **Additional positions**
Include justification - must include sample schedule that shows positions filled

How many: _____

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☒ PSAP move

Estimated date: TBD
Possible location: TBD

Fiscal Year 2019 (July 2018-June 2019)

Budget Items

☐ **Logging recorder** - Partial reimbursement only
Include justification - age and condition of present recorder
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

Estimated # of channels _____
Estimated purchase date _____

☐ **Additional positions**
Include justification - must include sample schedule that shows positions filled

How many _____

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move

Estimated date _____
Possible location _____

Fiscal Year 2020 (July 2019-June 2020)

Budget Items

☐ **Logging recorder** - Partial reimbursement only
Include justification - age and condition of present recorder
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

Estimated # of channels _____
Estimated purchase date _____

☐ **Additional positions**
Include justification - must include sample schedule that shows positions filled

How many _____

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move

Estimated date _____
Possible location _____

Contact: DOREEN WASICK
Phone #: 480. 644 - 4250
Fax #: 480 · 644 · 5491
Date: 5-19-2014

Please return to:

Liz Graeber
Phoenix Fire Dept - Maricopa Region 911 Services
150 S 12th St
Phoenix, AZ 85034
Fax: 602-495-3751
email: liz.graeber@phoenix.gov

Budget Requests for FY 2016 - FY 2020 PSAP: Paradise Valley Police

Fiscal Year 2016 (July 2015-June 2016)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____ N/A

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

N/A

Possible location _____

Fiscal Year 2017 (July 2016-June 2017)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____ N/A

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2018 (July 2017-June 2018)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____ N/A

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2019 (July 2018-June 2019)

Budget Items

☐ **Logging recorder** - Partial reimbursement only
Include justification - age and condition of present recorder
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

Estimated # of channels _____
Estimated purchase date _____ N/A

☐ **Additional positions**
Include justification - must include sample schedule that shows positions filled

How many _____

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move

Estimated date _____
Possible location _____

Fiscal Year 2020 (July 2019-June 2020)

Budget Items

☐ **Logging recorder** - Partial reimbursement only
Include justification - age and condition of present recorder
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

Estimated # of channels _____
Estimated purchase date _____ N/A

☐ **Additional positions**
Include justification - must include sample schedule that shows positions filled

How many _____

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move

Estimated date _____
Possible location _____

Contact: Shauna Henrie
Phone #: 480.348.3543
Fax #: 480.348.3623
Date: 4.14.2014

Please return to:

Liz Graeber
Phoenix Fire Dept - Maricopa Region 911 Services
150 S 12th St
Phoenix, AZ 85034
Fax: 602-495-3751
email: liz.graeber@phoenix.gov

Budget Requests for FY 2016 - FY 2020

PSAP: Peoria Police Dept

Fiscal Year 2016 (July 2015-June 2016)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2017 (July 2016-June 2017)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2018 (July 2017-June 2018)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2019 (July 2018-June 2019)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____
Include justification - age and condition of present recorder — Estimated purchase date _____
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____
Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____
Possible location _____

Fiscal Year 2020 (July 2019-June 2020)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____
Include justification - age and condition of present recorder — Estimated purchase date _____
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____
Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____
Possible location _____

Contact: Anje Reimer, Police Communications Manager
Phone #: 623-773-7011
Fax #: 623-773-7030
Date: June 4, 2014

Please return to:

Liz Graeber
Phoenix Fire Dept - Maricopa Region 911 Services
150 S 12th St
Phoenix, AZ 85034
Fax: 602-495-3751
email: liz.graeber@phoenix.gov

Budget Requests for FY 2016 - FY 2020

PSAP: PHOENIX

Fiscal Year 2016 (July 2015-June 2016)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2017 (July 2016-June 2017)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2018 (July 2017-June 2018)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2019 (July 2018-June 2019)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____
Include justification - age and condition of present recorder — Estimated purchase date _____
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____
Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____
Possible location _____

Fiscal Year 2020 (July 2019-June 2020)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____
Include justification - age and condition of present recorder — Estimated purchase date _____
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____
Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____
Possible location _____

Contact: DAN MCNEECE
Phone #: 534-7410
Fax #: 534-1454
Date: 4/18/14

Please return to:

Liz Graeber
Phoenix Fire Dept - Maricopa Region 911 Services
150 S 12th St
Phoenix, AZ 85034
Fax: 602-495-3751
email: liz.graeber@phoenix.gov

Budget Requests for FY 2016 - FY 2020

PSAP: Salt River PD

Fiscal Year 2016 (July 2015-June 2016)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2017 (July 2016-June 2017)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2018 (July 2017-June 2018)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2019 (July 2018-June 2019)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____
Include justification - age and condition of present recorder — Estimated purchase date _____
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____
Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____
Possible location _____

Fiscal Year 2020 (July 2019-June 2020)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____
Include justification - age and condition of present recorder — Estimated purchase date _____
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____
Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____
Possible location _____

Contact: Curtis Thomas
Phone #: 480-362-7970
Fax #: 480-362-7130
Date: June 11, 2014

Please return to:

Liz Graeber
Phoenix Fire Dept - Maricopa Region 911 Services
150 S 12th St
Phoenix, AZ 85034
Fax: 602-495-3751
email: liz.graeber@phoenix.gov

Budget Requests for FY 2016 - FY 2020

PSAP: Scottsdale PD

Fiscal Year 2016 (July 2015-June 2016)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2017 (July 2016-June 2017)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2018 (July 2017-June 2018)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2019 (July 2018-June 2019)

Budget Items

☐ **Logging recorder** - Partial reimbursement only
Include justification - age and condition of present recorder
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

Estimated # of channels _____
Estimated purchase date _____

☐ **Additional positions**
Include justification - must include sample schedule that shows positions filled

How many _____

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move

Estimated date _____
Possible location _____

Fiscal Year 2020 (July 2019-June 2020)

Budget Items

☐ **Logging recorder** - Partial reimbursement only
Include justification - age and condition of present recorder
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

Estimated # of channels _____
Estimated purchase date _____

☐ **Additional positions**
Include justification - must include sample schedule that shows positions filled

How many _____

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move

Estimated date _____
Possible location _____

Contact: Karen Sutherland
Phone #: 480-312-1961
Fax #: 480-312-9161
Date: 6/25/14

Please return to:

Liz Graeber
Phoenix Fire Dept - Maricopa Region 911 Services
150 S 12th St
Phoenix, AZ 85034
Fax: 602-495-3751
email: liz.graeber@phoenix.gov

Budget Requests for FY 2016 - FY 2020 PSAP: Surprise Police Department

Fiscal Year 2016 (July 2015-June 2016)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2017 (July 2016-June 2017)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2018 (July 2017-June 2018)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☒ **Additional positions** — How many 1

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2019 (July 2018-June 2019)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____
Include justification - age and condition of present recorder — Estimated purchase date _____
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____
Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____
Possible location _____

Fiscal Year 2020 (July 2019-June 2020)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____
Include justification - age and condition of present recorder — Estimated purchase date _____
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____
Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____
Possible location _____

Contact: Domela Finnessey
Phone #: 623-222-4323
Fax #: 623-222-4001
Date: April 21, 2014

Please return to:

Liz Graeber
Phoenix Fire Dept - Maricopa Region 911 Services
150 S 12th St
Phoenix, AZ 85034
Fax: 602-495-3751
email: liz.graeber@phoenix.gov

Budget Requests for FY 2016 - FY 2020 PSAP: Tolleson Police Department

Fiscal Year 2016 (July 2015-June 2016)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2017 (July 2016-June 2017)

Budget Items

☒ **Logging recorder** - Partial reimbursement only — Estimated # of channels 16

Include justification - age and condition of present recorder — Estimated purchase date 9/1/2016

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2018 (July 2017-June 2018)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2019 (July 2018-June 2019)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____
Include justification - age and condition of present recorder — Estimated purchase date _____
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____
Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____
Possible location _____

Fiscal Year 2020 (July 2019-June 2020)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____
Include justification - age and condition of present recorder — Estimated purchase date _____
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____
Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____
Possible location _____

Contact: Tonia Rogers
Phone #: 623-936-2738
Fax #: 623-907-2775
Date: June 5, 2014

Please return to:

Liz Graeber
Phoenix Fire Dept - Maricopa Region 911 Services
150 S 12th St
Phoenix, AZ 85034
Fax: 602-495-3751
email: liz.graeber@phoenix.gov

Budget Requests for FY 2016 - FY 2020 PSAP: Wickenburg

Fiscal Year 2016 (July 2015-June 2016)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☒ **Additional positions** — How many 3

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2017 (July 2016-June 2017)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2018 (July 2017-June 2018)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____

Include justification - age and condition of present recorder — Estimated purchase date _____

Documents needed for reimbursement - copy of invoice and check

Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____

Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____

Possible location _____

Fiscal Year 2019 (July 2018-June 2019)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____
Include justification - age and condition of present recorder — Estimated purchase date _____
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____
Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____
Possible location _____

Fiscal Year 2020 (July 2019-June 2020)

Budget Items

☐ **Logging recorder** - Partial reimbursement only — Estimated # of channels _____
Include justification - age and condition of present recorder — Estimated purchase date _____
Documents needed for reimbursement - copy of invoice and check
Must be purchased off of state contract or through bid process

☐ **Additional positions** — How many _____
Include justification - must include sample schedule that shows positions filled

The state does not fund PSAP moves but because the Maricopa Region 911 team needs to be involved please advise of any upcoming moves.

☐ PSAP move — Estimated date _____
Possible location _____

Contact: Ken Lutkiewicz
Phone #: 928-668-0535
Fax #: 928-684-7934
Date: 04-16-14

Please return to:

Liz Graeber
Phoenix Fire Dept - Maricopa Region 911 Services
150 S 12th St
Phoenix, AZ 85034
Fax: 602-495-3751
email: liz.graeber@phoenix.gov

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE

9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE-911

A. Description

1. Emergency number 911 Service is an exchange service whereby a public safety answering point (PSAP) designated by the customer may receive calls dialed to the telephone number 911. The service includes facilities and equipment needed to switch and transport to the designated PSAP emergency calls originated by persons within the serving area who dial 911.

2. The 911 customer may be a municipality or other state or local government unit, or an authorized agent of one or more of these units. The customer must be legally authorized to subscribe to the service and have public safety responsibility by law to respond to public emergency calls within the telephone CO areas arranged for 911 calling.

3. 911 Service is offered subject to availability of facilities and equipment.

4. Three types of 911 Service are offered: B911, C911, and E911.

   - B911 Service provides for routing all 911 calls originated from telephones within a given CO prefix code to a single PSAP.

   - C911 Service provides the B911 service feature as well as calling party hold, switchhook status, forced disconnect, idle tone, and emergency ringback.

   - E911 Service is an expanded 911 Service with features such as selective routing of 911 calls to a specific PSAP selected from among those within the 911 Service area. E911 has certain other standard and optional features which may or may not be available with B911 or C911.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE-911 (Cont'd)

B. Definitions

911 Service Area

The geographic area where a customer will have the capability to respond to all 911 calls and dispatch appropriate emergency assistance.

Additional E911 Business Exchange Access Line

An optional additional terminating business exchange access line at a PSAP.

Alternate Routing (AR)

Method by which calls are routed to a designated alternate PSAP location if all E911 business exchange access lines to the primary PSAP are busy or the primary PSAP is closed down for a period.

Automatic Location Identification (ALI)

A feature by which information associated with the calling party's telephone number is forwarded to the PSAP for display. Additional telephones with the same number as the calling party's (secondary locations, off premises extensions, etc.) will be associated with the main location address.

Automatic Number Identification (ANI)

A feature by which the calling party's telephone number is forwarded to the display and transfer unit at the PSAP.

Calling Party Hold (CPH)

A feature of C911 Service that enables a PSAP attendant to retain control of an incoming 911 call even if the calling party hangs up.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE-911

B. Definitions (Cont'd)

Default Routing (DR)

A feature activated when an incoming E911 call cannot be selectively routed due to an ANI failure, garbled digits or other causes. Such incoming calls are routed from the E911 Control Office to an assigned default PSAP.

Emergency Ringback

A feature that allows the PSAP attendant to ringback on an incoming 911 call that is on hold. Calling party hold is a prerequisite for this feature.

Emergency Service Number (ESN)

A number that defines the type of emergency services (e.g., police fire or hospital) within the 911 Service Area. An ESN is associated with a primary PSAP and possibly one or more secondary PSAPs.

End Office

A CO that receives originating 911 calls.

E911 Control Office

A CO that provides tandem switching of 911 calls and ANI information to the PSAP and also provides the SR feature, speed calling, and call transfer capabilities as well as certain network maintenance functions for each PSAP.

E911 Transport

Utilization of dedicated point-to-point facilities between an End Office or a Private Branch Exchange and Competitive Exchange an E911 Control Office, a Control Office and a PSAP Serving Central Office, and/or a PSAP Serving Central Office and a Node to transmit a telephone number (ANI Transport), a name and address (ALI Transport), or routing information (Selective Routing Transport) associated with a 911 call.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE-911

B. Definitions (Cont'd)

Fixed Transfer

An E911 Service feature that permits attendants to transfer calls to secondary PSAPs by depressing a button associated with each such PSAP on the display and transfer unit console equipment.

Forced Disconnect

A feature that allows the PSAP attendant to release a connected call even though the calling party has not hung up. This prevents blockage of incoming 911 business exchange access lines serving the PSAP.

Idle Tone Application

A feature that allows the PSAP attendant to distinguish between calls abandoned before they are answered and instances in which the calling party is unable to speak for some reason. If the call is abandoned, a distinct tone is heard. If the caller is still on the line but unable to speak, no tone is heard.

Manual Transfer

A feature that enables the PSAP attendant to transfer an incoming 911 call by depressing the switchhook of the associated telephone or the add button on the display and transfer console units and dialing a 7 or 10 digit telephone number or a speed calling code.

Master Street Address Guide (MSAG)

A data base of street names and address ranges within their associated communities defining emergency service zones for 911 purposes.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE-911

B. Definitions (Cont'd)

Node

A computer used to expand the limitations of the E911 system from 16 PSAPs to 384 PSAPs.

P.01 Grade of Service

Trunk facility provisioning to ensure that during the average busy hour, no more than 1% of calls into the E911 system will encounter a busy condition.

Private Branch Exchange (PBX)

A private, internally switched telephone system of significance to an E911 system because internal PBX stations may not always be contained in the ALI/DMS, and as a result, may not be correctly displayed by Automatic Number Identification or Automatic Location Identification equipment.

Private Branch Exchange (PBX) Station

A telephone with a unique identifying number which is connected internally and directly to the PBX.

Private Switch/Automatic Location Identification (PS/ALI)

PS/ALI is a service offering which allows a PBX switch to send Automatic Number Identification information to an E911 Control Office (Tandem) from individual PBX stations for the purpose of providing site or station location information on an E911 call, or for selectively routing that call to the appropriate PSAP. PS/ALI also is available to Centrex/*CENTRON* customers who wish to provide the E911 system with more specific location and routing information. These are the only intended uses for this service.

Private Switch/Automatic Location Identification (PS/ALI) Customer

The PS/ALI customer may be a municipality or other state or local governmental unit, or an authorized agent of one or more municipalities or other state or local governmental units, or a PBX owner/operator, or Centrex/*CENTRON* customer who desires to provide station location information to the E911 system.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE-911

B. Definitions (Cont'd)

Private Switch/Automatic Location Identification (PS/ALI) Customer

The PS/ALI customer may be a municipality or other state or local governmental unit, or an authorized agent of one or more municipalities or other state or local governmental units, or a PBX owner/operator, or Centrex/*CENTRON* customer who desires to provide station location information to the E911 system.

Public Safety Answering Point (PSAP)

An answering location for 911 calls originating in a given area. PSAPs are designated as primary or secondary, which refers to the order in which calls are directed for answering. Primary PSAPs receive calls directly from the public; secondary PSAPs receive calls only on a transfer or relay basis from the primary PSAP. Secondary PSAPs generally serve as centralized answering locations for a particular type of emergency call. PSAPs are staffed by employees of service agencies such as police, fire or emergency medical or by employees of a common bureau serving a group of such entities.

Selective Routing (SR)

An E911 Service feature that permits a 911 call to be routed from a CO to the designated primary PSAP based upon the identified number of the calling party.

Selective Transfer

A feature that allows the PSAP attendant to transfer a call to another agency by depressing a button labeled with the type of agency, e.g., Fire, on the display and transfer unit console. This type of transfer is only available when SR is provided.

Serving CO

The CO from which a PSAP, either primary or secondary, is served.

Switchhook Status

A feature that provides the PSAP attendant audible and visual indications of whether a 911 call put on hold is still on hold or has disconnected.

Trunk

A circuit connecting switching equipment between two sites, as between a PBX and central office, or between two central offices.

Issued: 3-18-13

Effective: 3-19-13

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE-911 (Cont'd)

C. Service Features

1. B911 Service

a. B911 Service includes the Company provision of the 911 code to the exchange network in those central offices that fall within the boundaries of the municipalities or other governmental units that subscribe to 911 service and one way incoming 911 business exchange access lines.

b. B911 Service provides for the routing of all 911 calls originated by telephones served by a given CO to a single PSAP via business exchange access lines. B911 service connects such calls to a PSAP via a business exchange access line in a manner similar to normal local exchange telephone calls. No other features are provided with this offering. The customer must subscribe to a minimum of two business exchange access lines to receive 911 calls at the designated PSAP.

c. When a customer request for B or C911 Service requires CO 911 code openings or build outs to provide 911 Service prior to Company scheduled CO rearrangements or replacement, the customer will incur the cost of such code opening or build outs. However, if the 911 code is available or is scheduled to be opened and no CO build out is required, then the customer will not be charged additionally for B or C911 Service other than that which is applicable.

2. C911 Service

C911 Service provides B911 Service plus forced disconnect, idle tone application, calling party hold, emergency ringback and switchhook status features. Activation of the switchhook status and emergency ringback features requires the use of appropriate equipment at the PSAP location.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE-911

C. Service Features (Cont'd)

3. E911 Service

a. E911 Service is available in the following service feature offerings:

Selective Routing (SR)[1]

Charges are based on the total number of main (excluding PALs), and equivalent main, excluding Out-WATS, PBX, Centrex CO and ESSX-1, access exchange lines served by the local central offices equipped for SR only.

Automatic Number Identification and Automatic Location Identification (ANI-ALI)

Charges are based on the total number of main (excluding PALs), and equivalent main, excluding Out-WATS, PBX, Centrex CO and ESSX-1 access exchange lines to which both ANI and SR applies.

Automatic Number Identification, Automatic Location Identification, and Selective Routing (ANI/ALI/SR)

Charges are based upon the total number of main (excluding PALs), and equivalent main, excluding Out-WATS, PBX, Centrex CO and ESSX-1 exchange access lines to which ANI, ALI, and SR apply.

[1] When SR is furnished, different features may be applied to certain exchange access lines without being applied to all exchange access lines served by the local CO. Thus, where two jurisdictions are served by a single local CO, each jurisdiction may select a different feature combination as long as SR is one of the features.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE-911

C.3. (Cont'd)

b. The following standard features are included with each of the E911 Service offerings:

- Forced disconnect
- Default routing
- Alternate routing (night service)
- Speed calling
- CO transfer arrangements

D. Transport

1. All 911 facilities will be engineered, installed, and maintained by the Company at sufficient levels to provide a minimum of P.01 Grade of Service. In all situations, a minimum of two circuits will be provided to connect each End Office in the E911 System to the E911 Control Office and/or to the PSAP Serving Central Office.

2. Secondary PSAPs that are not equipped to display ANI information on CPE will receive calls on a transfer basis over the exchange network or the customer may subscribe for an additional E911 Exchange Line.

E. Terms and Conditions

1. 911 Service is limited to the use of the number code 911 as the universal emergency number. Only one 911 Service will be provided within any government agency's jurisdiction.

2. The 911 emergency number is not intended as a total replacement for the service of the various public safety agencies which participate in the use of this number. The public safety agencies will subscribe to other local exchange telephone service for administrative use or other.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE-911

E. Terms and Conditions (Cont'd)

3. This service is furnished to the customer only for the purpose of receiving reports of emergencies from the public.

4. 911 Service is classified as flat business exchange service and is arranged for one-way incoming service to the appropriate PSAP. Outgoing calls can only be made on a transfer basis. CO transfer is not provided on B911 or C911 Service.

5. Temporary suspension of service is not provided for any part of the 911 Service.

6. The Company does not answer and forward 911 calls, but furnishes the use of its facilities and equipment to enable the customer's personnel on the customer's premises, to respond to such calls.

7. The Company shall not be required to provide 911 Service to less than an entire CO and will not provide a mix of B911, C911, and E911 Service within a given CO.

8. The rates charged for 911 Service do not contemplate the inspection or constant monitoring of facilities to discover errors, defects, and malfunctions in the service, nor does the Company undertake such responsibility. The customer shall make such operational tests as, in the judgment of the customer, are required to determine whether the system is functioning properly. The customer shall promptly notify the Company in the event the system is not functioning properly.

9. The Company's intent will be to provide at least the same level of service reliability and quality for 911 Service as it provides for the telephone service in the same exchanges.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE-911

E. Terms and Conditions (Cont'd)

10. The Company's entire liability to any person for interruption or failures of 911 Service shall be limited to the terms set forth herein and in Section 2.

11. The Company's liability for any loss or damage arising from errors, interruptions, defects, failure, or malfunctions of this service or any part of thereof whether caused by the negligence of the Company or otherwise shall not exceed the greater of:[1]

	LIABILITY
• Liability refund of (or)	$58.00
• An amount equivalent to the pro rata charges for the service affected during the period of time that the service was fully or partially inoperative	[1]

12. 911 Service is provided solely for the benefit of the customer operating the PSAP. The provision of 911 Service by the Company shall not be interpreted, construed, or regarded, either expressly or implied, as being for the benefit of or creating any Company obligation toward any third person or legal entity other than the customer.

13. Each E911 customer and Private Switch/Automatic Location Identification (PS/ALI) customer agrees to release, indemnify, defend and hold harmless the Company from any and all loss, claims, demands, suits or other action, or any liability whatsoever, whether suffered, made, instituted, or asserted by the customer or by any other party or person, for any personal injury to or death of any person or persons, or for any loss, damage or destruction of any property, whether owned by the customer or others.

[1] These limited damages shall be in addition to any credit which may be given for an out-of-service condition.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE

9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE-911

E. Terms and Conditions (Cont'd)

14. The E911 customer and PS/ALI customer also agree to release, indemnify, and hold harmless the Company for any infringement or invasion of the right of privacy of any person or persons, caused or claimed to have been caused, directly or indirectly, by the installation, operation, failure to operate, maintenance, removal, presence, condition, occasion or use of E911 Service features, PS/ALI and the equipment associated therewith, or by any services furnished by the Company in connection therewith, including, but not limited to, the identification of the telephone number, address, or name associated with the telephone used by the party or parties accessing E911 Service or PS/ALI hereunder, and which arise out of the negligence or other wrongful act of the customer, its user, agencies, or municipalities, or the employees or agents of any one of them.

15. It is the obligation of the customer to make arrangements to handle all 911 calls that originate from telephones served by central offices in the local service area whether or not the calling telephone is situated on property within the geographical boundaries of the customer's public safety jurisdiction.

16. Application for 911 Service must be executed in writing by each customer. If application for service is made by an agent, the Company must be provided in writing with satisfactory proof of the appointment of the agent by the customer. At least one local law enforcement agency must be included among the participating agencies in any 911 offering.

17. The customer must furnish the Company its agreement to the following terms and conditions:

    - That all 911 calls will be answered on a 24-hour day, 7-day week basis.

    - That the customer has responsibility for dispatching the appropriate emergency service vehicles within the 911 Service Area, or will undertake to transfer all 911 calls received to the governmental agency with responsibility for dispatching such services, to the extent that such services are reasonably available.

    - That the customer will develop an appropriate method for responding to calls for nonparticipating agencies which may be directed to the PSAP by calling parties.

    - That the customer will subscribe to, or provide, telephone equipment with a capacity adequate to handle the number of incoming 911 business exchange access lines recommended by the Company to be installed.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE-911

E. Terms and Conditions (Cont'd)

18. Terminal equipment used in conjunction with 911 Service and with the ANI feature shall be configured so that it is unable to extract any other information, relating to the calling party, other than the calling number.

19. E911 Service information, consisting of the names, addresses, and telephone number of customers whose listings are not published in directories or listed in Directory Assistance offices, is confidential. Information will be provided on a call-by-call basis only for the purpose of responding to 911 emergency calls.

20. When 911 Service is provided the 911 calling party forfeits the privacy afforded by Nonlisted or Nonpublished Service to the extent that the telephone number, address, and name associated with the originating station location may be furnished in connection with a call to 911.

21. Central offices that are not currently equipped to transmit ANI will not be modified to provide ANI just for 911 Service: When the selective routing feature is provided, in such circumstances, default routing and CO identification will be provided in lieu of selective routing and ANI display.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE-911

E. Terms and Conditions (Cont'd)

22. When the selective routing feature is provided, the customer is responsible for identifying primary and secondary PSAP locations as well as the unique combinations of police, fire, and ambulance or any other appropriate agencies responsible for providing emergency service in the E911 Serving Area. An Emergency Service Number (ESN) will be provided for each unique combination by the Company. The customer will associate these ESNs with street address ranges or other mutually agreeable routing criteria in the E911 Serving Area. These ESNs will be carried in the Data Management System (DMS) to permit routing of 911 calls to the primary and secondary PSAPs responsible for handling of calls from each telephone in the E911 Serving Area. The following terms define the customer's responsibility in providing this information:

- Initial and subsequent ESN assignments by street address, range, or other mutually agreeable routing criteria shall be furnished by the customer to the Company prior to the effective date of service.

- After the establishment of service, it is the customer's responsibility to continue to verify the accuracy of the routing information contained in the MSAG, and to advise the Company of any changes in street names, establishment of new streets, changes in address numbers used on existing streets, closing, and abandonment of streets, changes in police, fire, ambulance, or other appropriate agencies' jurisdiction over any address, annexations, and other changes in municipal and county boundaries, incorporation of new cities or any other matter that will affect the routing of 911 calls to the proper PSAP.

- The Company will provide to the customer on request a complete written copy of the MSAG to permit the customer to verify accuracy of the police, fire, and ambulance PSAP routing designations. Such information will not be used by the customer for any other purpose without the written consent of the Company.

- Changes, deletions, and additions which the customer desires to have made in the MSAG should be submitted on an as occurred basis.

- The Company will furnish a written copy to the customer for verification showing each change, deletion, and addition to the MSAG.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE-911

E. Terms and Conditions (Cont'd)

23. A minimum of two circuits will also be provided to connect the Serving Central Office(s) to the PSAP(s).

24. Where facilities permit, the customer can request diversification and redundancy of any or all inter-office and/or local facility routes. Additional charges for such service utilizing the facilities, or the construction and provisioning thereof, will be the responsibility of the customer and will be assess on an individual case basis.

25. When the ALI service feature is provided, two data facilities will be provided to connect each PSAP in the E911 Service Area to the Node.

26. The minimum number of circuits to a PSAP will be determined by the Company based upon the number of access lines to be served by the system. Secondary PSAPs that are not equipped to display ANI on compatible CPE will receive calls on a transfer basis over the exchange network or the customer may subscribe to additional E911 Transport Service.

27. The SR feature of PS/ALI will be limited to the E911 Serving Area in which the PBX is located as well as the E911 system's SR pattern, as prescribed by the E911 customer.

28. In a PS/ALI service application, the PBX owner/operator (or Centrex/*CENTRON* customer) must meet the following requirements.

    a. The PS/ALI customer must indicate in writing that the E911 customer has agreed to any potential changes in calling patterns or volumes resulting from the implementation of PS/ALI.

    b. Provide a single point of contact and written documentation to the Company stating that the PS/ALI customer will coordinate with its affected PSAP to:

        - Accept and dispatch calls for these PBX/*CENTRON* stations,
        - Assign appropriate ESNs, and
        - Provide any Master Street Address Guide additions or modifications that are required.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE-911

E.28. (Cont'd)

c. Provide full seven-digit ANI for every station within the PBX. This information must be approved by the Company prior to implementation to assure that no conflict exists between the PBX numbering plan and the Company's overall numbering plan.

d. ANI multifrequency signaling must conform to the specifications outlined in Technical Publication 77338, Qwest Corporation Enhanced 911 for Private Switch/Automatic Location Identification Service Network Interface Specification.

e. Create, maintain and forward to the Company, current telephone number and address data in the format specified by the Qwest Corporation Private Switch/Automatic Location Identification User's Manual at the time intervals mutually agreed upon by the Company and the PS/ALI customer.

f. Configure PBX to connect at least two dedicated voice grade trunks, recognize the "911" or "9911" code as a complete dialing sequence and routing those calls to this dedicated trunk group without overflowing calls to any other access facility in the PBX. Each system must maintain a P.01 Grade of Service or better for 911 call processing.

g. Develop and implement methods and procedures to prevent the use or misuse of the voice grade trunks for other than E911 telecommunications service. Misuse or abuse of the E911 PS/ALI trunk may result in disconnection of the service in addition to any remedies at law or equity including reimbursement of charges or other expenses associated with the misuse or abuse.

h. Order a minimum of two dedicated 911 trunks to the E911 Control Office (Tandem) for each PBX.

i. Use personal computer hardware and software (or PC equivalent hardware and software) for ongoing customer record update programs and processes, that conform to the specifications outlined in the Qwest Corporation Private Switch/Automatic Location Identification User's Manual.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE – 9-1-1 (Cont'd)

F. Wireless E9-1-1 Connectivity[1]

Wireless E9-1-1 Connectivity allows for the delivery of a wireless 9-1-1 call through the Company E9-1-1 network to a PSAP. Wireless carriers have the option of connecting directly through the Company E9-1-1 Control Office or through *CELLTRACE* which provides cell location and ANI information.

1. Connection through Company E9-1-1 Control Office

Carriers having the capability to provide wireless handset ANI, cell site and sector and/or longitudinal and latitudinal (x,y) coordinates in the appropriate format, may connect directly to the Company's E9-1-1 Control Office. The E9-1-1 Control Office will forward information to the PSAP as well as provide Selective Routing functions.

2. Definitions

ALI Delivery

The process which delivers the ALI information, and the wireless handset's ANI, cellsite and sector and/or longitudinal and latitudinal (x,y) coordinates to the PSAP.

Mobile Switching Center (MSC)

A Wireless Carriers switch that manages facilities used to provide wireless two-way telecommunications services.

[1] Per FCC Report and Order 94-102, the Carrier must at a minimum route a wireless caller's E9-1-1 call to the nearest PSAP and deliver the associated ten-digit wireless handset telephone number, the cell site and the sector.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE – 9-1-1

F.2. (Cont'd)

Psuedo ANI (PANI)

A unique seven digit non-dialable number used to route a wireless 9-1-1 call.

SR/ALI Phase I Wireless

Selective Routing/Automatic Location Identification (SR/ALI) Phase I provides for the routing of a wireless 911 call to a PSAP based on the PANI and delivery of ALI information to the PSAP, including PANI, and the wireless handset's ANI. This information is "pushed" into the ALI database so that when the PSAP makes the ALI request, this location information is returned.

SR/ALI Phase II Wireless

SR/ALI Phase II provides for the routing of a wireless 911 call to a PSAP based on PANI information. In Phase II, the wireless carrier has equipment that finds latitude and longitude, x and y coordinates, of the caller when they dial 911. This information is held in their database based on the callers ANI. When the PSAP requests the ALI for the caller, they go to the ALI database to "pull" the latitude and longitude information from the wireless carrier's database. SR/ALI Phase II allows the PSAP to continually "pull" the latitude and longitude information via ALI. This ability to "pull" information is referred to as retrievable location (RLOC).

3. Terms and Conditions

a. Wireless E9-1-1 Connectivity is determined by the municipality, county, or state government unit, or an authorized agent to whom authority has been legally delegated. Phase I data (PANI) cellsite and sector, and wireless handset's ANI will be provided by Wireless Carriers if Phase II data (latitude and longitude, coordinates) is not available.

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9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE – 9-1-1

F.3. (Cont'd)

b. Delivery of wireless calls to the PSAP requires specific entries in the E9-1-1 ALI database. These entries must be MSAG valid and agreed upon by each PSAP. The entries are then loaded into the ALI database by the Wireless Carrier.

c. A minimum of two dedicated trunks are required between the MSC and the Selective Routing switch and are the responsibility of the Wireless Carrier. In addition, the PSAP is required to subscribe to two selective routing ports to terminate these incoming trunks.

d. SR/ALI Feature Options

(1) PSAPs must subscribe to either the SR/ALI per trunk port option or the End User Subscriber Option.

(2) To receive the SR/ALI End User Subscriber Option rate, the PSAPs must adhere to the following:

(a) Provide the Company with wireless carrier-specific end user subscriber counts when service is requested;

(b) For the purpose of true-up, annually provide the Company with wireless end user subscriber counts for the previous calendar year, by March 31st;

(3) PSAPs who do not provide the carrier-specific line counts at the time service is requested, or wireless line counts annually by March 31st, will be charged at the per-port rate USOC E8WFX, following.

e. The customer is responsible for determining call routing based on jurisdictional boundaries.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE – 9-1-1

F. (Cont'd)

4. Rate Stability

Wireless E9-1-1 Connectivity may be ordered on a month-to-month basis or under a rate stability service agreement for terms of 12 through 60 months.

Rate stability allows the customer to order service with the assurance that during the term of the service agreement the monthly rates for Wireless E9-1-1 Connectivity will not exceed the rates in effect at the time the rate stability service agreement is signed by the customer. If the stability plan rates are reduced in the Tariff, the rates under an Agreement shall also be reduced accordingly.

Under a rate stability service agreement, the monthly rate for Wireless E9-1-1 Connectivity shall be the monthly rate in effect for Wireless E9-1-1 Connectivity on the date the customer signs the service agreement.

a. Rate Stability Terms and Conditions

(1) The customer must specify the length of term requested at the time Wireless E9-1-1 Connectivity is ordered.

(2) At the end of the term of the rate stability service agreement the customer may negotiate a new service agreement, convert to month-to-month service or may terminate Wireless E9-1-1 Connectivity. The monthly rates will be those rates in effect at the time the new service agreement term begins. Should the customer not make a choice by the end of the term of the rate stability service agreement, Wireless E9-1-1 Connectivity rates will automatically revert to those in effect for the then current month-to-month option. If Wireless E9-1-1 Connectivity is continued under any of the pricing plans, including non-stabilized month-to-month, nonrecurring charges will not apply.

(3) Should the customer choose to discontinue all or part of Wireless E9-1-1 Connectivity prior to the completion of the term of the rate stability service agreement, termination charges may apply, as set forth in the Termination Liability/Waiver Policy specified in 2.2.14.D.

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9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE

9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE – 9-1-1

F.4.a. (Cont'd)

(4) Related monthly rates and nonrecurring charges for addition(s) to Wireless E9-1-1 Connectivity provided under a service agreement are the rates and charges in effect at the time of the addition(s).

(5) The Minimum Service Period for any Wireless E9-1-1 Connectivity rate stability service agreement is 12 months.

(6) Changes to Rate Stability Service Agreements

- Wireless E9-1-1 Connectivity provided on a month-to-month basis may be upgraded to a rate stability service agreement at any time without the customer incurring any nonrecurring charges.

- Wireless E9-1-1 Connectivity provided under a rate stability service agreement may be upgraded to a new service agreement, with a term equal to or greater than the term remaining in the existing service agreement at any time without the customer incurring any nonrecurring or termination charges. New Minimum Service Periods apply to the new rate stability agreement.

- Wireless E9-1-1 Connectivity monthly rates will be those in effect at the time the new rate stability service agreement is signed by the customer.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE – 9-1-1 (Cont'd)

G. Rates and Charges

1. The calling party is not charged for calls placed to the 911 number.

2. Where applicable, charges for messages transferred over local exchange facilities from a PSAP are billed according to rates applicable from the CO serving the PSAP initiating the transfer to the point of termination of the transfer.

3. Established rates for business exchange access lines apply for B911 and C911 business access lines that terminate at the designated PSAPs. The monthly rate for the business exchange access line is the rate applicable for the exchange area in which the PSAP is located. A minimum of two such lines, from the PSAP's serving CO, are required.

4. If facilities are provided from exchanges or COs that do not have local calling to the exchange in which the PSAP is located, charges for FX or FCO service, as specified in the Competitive Private Line Transport Services Tariff, are applicable.

5. Voice grade circuits, dedicated private lines, exchange service extension lines and other such facilities connecting a PSAP to various agencies such as police, fire, or ambulance service, are provided at established rates and charges for such facilities as specified in the Competitive Private Line Transport Services Tariff.

6. Company or customer-provided equipment may be furnished to terminate 911 facilities at any PSAP. If customer-provided terminal equipment is employed at a PSAP, it will be furnished in accordance with the terms and conditions set forth in this section.

7. Charges for customer requests that necessitate additions, removals, moves, or changes of exchange access facilities and/or equipment on Company premises will be based upon costs per request.

8. Phase II RLOC is an incremental charge to the Phase I SR/ALI feature functionality.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE – 9-1-1

G. Rates and Charges (Cont'd)

9. The following rates and charges apply, as appropriate, for 911 Services:

a. B911 Service Access Line

	USOC	NONRECURRING MAXIMUM CHARGE	MONTHLY MAXIMUM RATE
• 911 access line, each	91L	$ 50.00	$ 50.00
b. C911 Service Access Line			
• 911 access line, each	91L	50.00	50.00
• CO feature package, each business exchange access line equipped	B92	974.20	160.31

	USOC	NONRECURRING CURRENT CHARGE	MONTHLY CURRENT RATE
• 911 access line, each[1]	91L	$ 50.00	$ **32.59** (I)
b. C911 Service Access Line			
• 911 access line, each[1]	91L	50.00	**32.59** (I)
• CO feature package, each business exchange access line equipped	B92	974.20	160.31

[1] Service also includes rates and charges for Hunting as found in Section 5.4. (T)

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE – 9-1-1

G.9. (Cont'd)

c. E911 Service

(1) E911 rates and charges are dependent upon the number of main stations (excluding PALs), PBX and Centrex CO or ESSX-1 exchange access lines served in the E911 area. Such information will be based upon the previous 12 months in service access line data which will be updated annually for billing purposes.

(2) Service Features[1,2]

	USOC	NONRECURRING CHARGE	MONTHLY RATE
• Automatic Number Identification, per 1,000 exchange access lines served	E8X	$ 240.63	$ 10.18
• Selective Routing, per 1,000 exchange access lines served	E8R	1,339.98	58.86
• Automatic Number Identification, and Automatic Location Identification, per 1,000 exchange access lines served	E8V	1,331.62	55.15
• Automatic Number Identification, Automatic Location Identification and Selective Routing, per 1,000 exchange access lines served	E8Z	2,368.48	103.94

[1] Charges do not include E911 Transport. See (3), following, for rates and charges.

[2] Pursuant to Decision No. 73354, for a period of three years following the 8/21/12 effective date of this decision, maximum rates for this service (when established) may not be greater than 25% of the actual rates which were in effect on 8/21/12.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE – 9-1-1

G.9.c. (Cont'd)

(3) E911 Transport[1]

	USOC	NONRECURRING CHARGE	MONTHLY RATE
• Automatic Number Identification, per 1,000 exchange access lines served	C9B	$137.42	$ 9.85
• Selective Routing Transport, per 1,000 exchange access lines served	C9G	137.42	9.85
• Automatic Number Identification and Automatic Location Identification Transport, per 1,000 exchange access lines served	C9Q	160.33	13.46
• Automatic Number Identification, Automatic Location Identification and Selective Routing Transport, per 1,000 exchange access lines served	C9T	145.62	13.46
• Additional (optional) E911 business exchange access line terminating at PSAP, each	E8K	670.75	91.75

[1] Pursuant to Decision No. 73354, for a period of three years following the 8/21/12 effective date of this decision, maximum rates for this service (when established) may not be greater than 25% of the actual rates which were in effect on 8/21/12.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE – 9-1-1

G.9.c. (Cont'd)

(4) E911 Access Line

(a) An E911 access line is a 911 facility which:

- Terminates at a location other than a PSAP,
- Does not have access to the ANI or Master Controller; and
- Is arranged for incoming calls only except as it may obtain dial tone by means of depressing the switchhook following completion of a call transfer by the controlling PSAP location. The controlling PSAP may drop off the line once the connection has been established.

(b) The following rates and charges apply when an E911 access line terminates at a location other than a PSAP.

	USOC	NONRECURRING MAXIMUM CHARGE	MONTHLY MAXIMUM RATE
• E911 access line, each[1]	E9J	$50.00	$50.00

	USOC	NONRECURRING CURRENT CHARGE	MONTHLY CURRENT RATE
• E911 access line, each[2]	E9J	$50.00	**$32.59** (I)

[1] Service also includes rates and charges for Hunting as found in Section 5. (T)

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE – 9-1-1

G.9.c. (Cont'd)

(4) E911 Access Line

(c) When the E911 access line is terminated at a CO other than the E911 control office, the following rates and charges will apply in addition to the E911 access line rates and charges.

	USOC	NONRECURRING CHARGE	MONTHLY RATE
• E911 channel terminals, each, minimum of 2 terminals required	E1C	[1]	[1]
• E911 conditioning and signaling	E9B	[1]	[1]
• E911 channel	1LXQ+	[1]	[1]

[1]SEE SECTION 5 OF THE COMPETITIVE PRIVATE LINE TRANSPORT SERVICES TARIFF FOR RATES AND CHARGES.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE – 9-1-1

G.9. (Cont'd)

d. Wireless Connectivity

	USOC	NONRECURRING CHARGE[3]	MONTHLY RATE[3]
(1) Phase I Selective Routing/ Automatic Location Identification Trunk Port for each,			
• Incoming trunk	E8W1X	$ 14.08	$ 9.82
• Outgoing trunk	E8WOX	38.82	9.82
(2) Phase I Selective Routing/Automatic Location Identification Features			
• Selective Routing/ Automatic Location Identification Features, per trunk port	E8WFX	1417.20	718.50
• Selective Routing/ Automatic Location Identification Features, per 100 Wireless End User Subscribers[1]	E8WEX	14.17	7.18
(3) Phase II Retrievable Location Feature Functionality[2]			
• Upgrade to ALI database, Per PSAP	WR9	$548.58	$116.60

[1] Rounded to nearest 100 End User subscribers.

[2] RLOC Feature Functionality is in addition to the Selective Routing/Automatic Location Identification Features selected in G.9.d.(2).

[3] Pursuant to Decision No. 73354, for a period of three years following the 8/21/12 effective date of this decision, maximum rates for this service (when established) may not be greater than 25% of the actual rates which were in effect on 8/21/12.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE – 9-1-1

G. Rates and Charges (Cont'd)

10. Private Switch/Automatic Location Identification (PS/ALI)

	USOC	NONRECURRING CHARGE[2]	MONTHLY RATE[2]
a. Service Provisioning			
• First circuit installed	SCH	$159.30	–
• Each additional circuit	SCHAX	95.00	–
b. Automatic Location Identification (ALI), per 1,000 records[1]	9DM	252.67	$73.63
c. Combined ALI and Selective Routing			
• Per 1,000 records[1]	9DW	252.67	73.63
• Selective Routing, per incoming trunk	SZ61X	390.95	36.23
d. Selective Routing only			
• Per 1,000 records[1]	9D2	252.67	73.63
• Per incoming trunk	SZ61X	389.16	36.23
e. Network Access Channel			
• Two-wire, per channel	XCD2D	–	7.00
• Four-wire, per channel	XCD4D	–	14.00

[1] Rates and charges apply to a minimum of 1,000 records. Rates and charges also apply to each additional 1,000 records. Any fraction of 1,000 records will be rounded to the nearest thousand. Record count will be reviewed annually to update billing.

[2] Pursuant to Decision No. 73354, for a period of three years following the 8/21/12 effective date of this decision, maximum rates for this service (when established) may not be greater than 25% of the actual rates which were in effect on 8/21/12.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE – 9-1-1

G.10. (Cont'd)

	USOC	NONRECURRING CHARGE[1]	MONTHLY RATE[1]
f. Channel Performance			
• Voice Grade 33 Reverse Battery Signaling	CE92X	$131.72	$ 5.60
• Voice Grade 33 E&M Signaling	CE94X	45.93	16.00
g. Transport Mileage, per mileage band			
Mileage Bands, per circuit			
• Over 0 to 8			
- Fixed	XU9D3	25.12	9.50
- Per mile	XE9DC	–	0.80
• Over 8 to 25			
- Fixed	XU9D4	25.12	9.50
- Per mile	XE9DD	–	0.85
• Over 25 to 50			
- Fixed	XU9D5	25.12	9.50
- Per mile	XE9DE	–	1.05
• Over 50			
- Fixed	XU9D6	25.12	9.50
- Per mile	XE9DF	–	1.10

[1] Pursuant to Decision No. 73354, for a period of three years following the 8/21/12 effective date of this decision, maximum rates for this service (when established) may not be greater than 25% of the actual rates which were in effect on 8/21/12.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE – 9-1-1 (Cont'd)

H. Optional Billing and Payment Terms and Conditions (Surcharge)

1. In accordance with the Arizona Corporation Commission's Decision No. 52211 and upon acceptance by the Company, of a written application for 911 Service, the following billing and payment regulations may be applicable for the provision of 911 Service within the jurisdictional boundaries of the governmental entity (customer) ordering 911 Service and other participating governmental agencies.

2. Payment for the total applicable 911 Service recurring monthly rates or nonrecurring charges, including applicable taxes, will be shared equally by each main station exchange access line customer, as defined herein, served by a common 911 system from a CO equipped for 911 calling. The advance one month billing for this service will appear as a stated amount and shown as a 911 surcharge on each customer's main station access exchange line monthly bill.

3. The advance one month billing of the stated 911 surcharge will be based upon the results of a calculation of the total applicable monthly rates or nonrecurring charges, to provide 911 Service, divided by the total number of customer main station exchange access lines associated with such service, at the time 911 Service or an installation charge surcharge is implemented or adjusted annually as described below.

4. Surcharges for nonrecurring charges or monthly rates will be billed upon service implementation. Any surcharge for nonrecurring charges associated with the initial establishment of 911 Service will be calculated to allow recovery of the total initial nonrecurring charges within a reasonable amount of time. Subsequent additions of features will be included in the annual fixed surcharge revision.

5. Revisions, if applicable, of the billed fixed surcharge will be made annually based on the number of main station exchange access lines in service, as described in E911 Rates and Charges (F.8.c.) preceding, at the end of the previous 12 month period, within the 911 Service area. This main station exchange access line data will function as a base for the billing and collection of applicable monthly rates, installation, or nonrecurring charges for the continued provision or installation of the 911 Service arrangement or for any additional service that is ordered by the customer to facilitate its administration and/or to fulfill its obligation under this offering. Billed surcharges will be rounded upward to the nearest full or whole penny amount.

9. CENTRAL OFFICE SERVICES

9.2 EMERGENCY REPORTING SERVICE
9.2.1 UNIVERSAL EMERGENCY NUMBER SERVICE – 9-1-1

H. Optional Billing and Payment Terms and Conditions (Surcharge) (Cont'd)

6. Upon either the disconnection of the service by the governmental entity or by discontinuance of the service offering by the Company, within a jurisdictional boundary, a final accounting will be made, 60 days from the disconnect or discontinuance date to the affected governmental entity. Such final billing will reflect the disposition of all funds billed and collected. Any remaining monies will be remanded as a refund equally to each of the total main station exchange access lines in service at disconnection or discontinuance of the service or to the Company in the event of a balance due billing.

9-1-1 Managed Services Technical Review

FINAL REPORT

SUBMITTED JUNE 2014 TO:
STATE OF ARIZONA 9-1-1 PROGRAM

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EXECUTIVE SUMMARY

Mission Critical Partners, Inc. (MCP) is pleased to provide the State of Arizona 9-1-1 Program (Program) with a Managed Services Technical Review report. The Program contracted with MCP to review all of the technical documentation associated with the Arizona solution and provide a written report outlining its strengths and vulnerabilities.

The 9-1-1 industry is experiencing significant change driven by advances in technology and our public safety professionals' steadfast dedication to serving their communities. Today's 9-1-1 network is outdated and is unable to keep up with the technology that is in the hands of end users. Additionally, 9-1-1 funding models are slow and difficult to change, which compounds the challenges that face public safety answering points (PSAPs) across the United States. As a result, the legacy 9-1-1 network and its operating model must change.

The State of Arizona (State) is taking a proactive approach to addressing the funding and technology challenges by considering a Managed 9-1-1 Services model. The Managed Services model offering is presented by CenturyLink, the long-time 9-1-1 service provider in the state. CenturyLink has partnered with the industry's leading solutions providers, Cassidian and Intrado, to offer a bundled services offering that will enable PSAPs across the state to upgrade their legacy call handling systems and migrate to an Emergency Services Internet Protocol (IP) Network (ESInet).

The proposed solution includes all of the major Next Generation 9-1-1 (NG9-1-1) services available to PSAPs today, including a redundant IP network, call routing, location data management, call handling equipment, text to 9-1-1, geographic information system (GIS) data management tools, and supplemental data. All of these services will be maintained to National Emergency Number Association (NENA) i3 standards and at the most recent software releases for the duration of the contract. The Managed Services offering provides PSAPs with the option to choose between two industry-leading customer premise equipment (CPE) systems; either the Intrado VIPER or the Cassidian VESTA. The majority of the hardware for the solution will be located in CenturyLink data centers and the maintenance of all hardware, including that which is located at the PSAPs will be the responsibility of CenturyLink. All of the services are provided by CenturyLink as the single point of contact for the solution, so that the Arizona 9-1-1 Program and the Arizona PSAPs will have only a single vendor to manage and a single bill to pay for 9-1-1 service.

As this is a bundled, service-based model, PSAPs will have a monthly recurring fee covering all NG9-1-1 services. Today, 9-1-1 call routing and data management services are monthly recurring fees, while the CPE requires the outlay of significant capital expenditures, typically on a five-year cycle. Ownership costs for CPE can vary with spikes in capital expenditures, as servers and other hardware require replacement due to obsolescence, normal wear and tear, or failure. In the procurement of the Managed Services, PSAPs will migrate to an operating expense model that is predictable and enables the PSAP to always have the latest technology. Meanwhile, the service will be provided by a solution

provider that leads the industry in NG9-1-1 call volume and has the longest track record in migrating PSAPs to a NG9-1-1 call-processing environment.

The vulnerabilities of the solution may be summarized as “the unknown.” A review of the CenturyLink/Intrado April 2014 outage in the state of Washington indicated that the source of the issue resided in a process that was unknown to the State and its PSAPs. MCP recommends that the Program complete a review of Intrado’s corrective actions and CenturyLink/Intrado joint follow-up actions stated in CenturyLink’s April 24, 2014, Major Outage Report to the Washington Utilities & Transportation Commission. Such prudence should serve Arizona with assurances that risk has been mitigated for the State as it and its PSAPs consider the procurement of NG9-1-1 services from CenturyLink in the future.

The CenturyLink documentation did not raise major concerns with the solution design and service offering. However, there are several areas where MCP recommends that additional documentation be detailed in a consolidated Services Agreement that is supported by significant service level agreements (SLAs). This will provide the State with definitive services and assurances that CenturyLink is committed to maintaining the services. Ultimately, as proposed, the solution appears feasible and would provide many beneficial services to the State’s PSAPs and its constituents in a service-based model that enables an efficient and predictable operating expense model.

1. BACKGROUND

The Program initially provided nine documents for MCP to review for the Managed Services Technical Review. MCP's task assignment was to review all of the technical documentation associated with the Managed 9-1-1 Services offering and provide a written report outlining the solution's strengths and vulnerabilities, as well as recommendations on how the vulnerabilities may be overcome. The review was to consider the requirements checklist and add additional requirements to ensure a thorough review of the Managed Services solution.

During the review period, MCP requested additional documentation be provided by the Program to address several Project Checklist Requirements. The Program did not have the documentation and requested that CenturyLink provide the information. CenturyLink delivered a set of documents in response to the Program's request within four business days. Table 1 provides a listing of the documents received and reviewed by MCP.

Table 1 – Technical Documents Reviewed

Document Name	Description	Date Received
A9-1-1 Great Migration Plan for AZ	June 2012 proposal for bundled, managed NG9-1-1 services offering	Monday, May 5, 2014
AZ NG9-1-1 Technical Review 4-14-14	CenturyLink Next Gen 9-1-1 and Managed 9-1-1 CPE Technical Overview for Arizona Solution	Monday, May 5, 2014
Clearview reports - A911	Guide for using Clearview reporting tool	Monday, May 5, 2014
Managed 911 - Service Level Goals - 6-11-2013	Description of CenturyLink Service Level Goals for 9-1-1 Routing and ALI Management Services	Monday, May 5, 2014
MapSAG	Intrado marketing sheet for MapSAG product	Monday, May 5, 2014
MPLS SLAs 6-11-2013	CenturyLink MPLS VPN Service Level Agreement	Monday, May 5, 2014
NG911 Managed Services - Arizona Network	Detailed network diagram	Monday, May 5, 2014
PAD MOP CenturyLink Work and Testing Instructions 102313CH Final	Work instructions document for PSAP Abandonment Device (PAD)	Monday, May 5, 2014
PowerProbe6000AndPowerProbe500_CCW-20472-0_DS_NM_0	PowerProbe marketing booklet for PowerProbe 6000 and PowerProbe 500 devices	Monday, May 5, 2014
Denver dn1	CenturyLink marketing sheet for Denver 1 data center	Tuesday, May 20, 2014
Denver dn2	CenturyLink marketing sheet for Denver 2 data center	Tuesday, May 20, 2014
Denver dn3	CenturyLink marketing sheet for Denver 3 data center	Tuesday, May 20, 2014

Document Name	Description	Date Received
MCP Responses Set 1 sed	CenturyLink responses to MCP's request for additional documentation	Tuesday, May 20, 2014
PBN-2013-Third Party IP-Recording Kit	Intrado's IP recording product bulletin	Tuesday, May 20, 2014

2. REQUIREMENTS CHECKLIST

The following requirements checklist was provided by the Arizona 9-1-1 Program. MCP added two additional requirements that may be viewed at the bottom of the checklist. The checklist was used to review the documentation provided against the system requirements.

Table 2 – Requirements Checklist

Status	Requirement	Reference
☑	Feasibility of proposed technical solution	Page 33
☑	Single Point of Contact Solution	Page 34
☑	Ubiquitous (eliminates or has the ability to eliminate communication boundaries such as but not limited to service provider, LATA and state boundaries)	Page 6
☑	NENA i3 compliant (current and future requirements)	Pages 7-10
☑	End-to-end IP signaling from VoIP endpoint to IP-enabled PSAP	Pages 10-11
☑	Geo-diverse	Pages 11-12
☑	Redundant (Identify any single points of failure)	Pages 12-13
☑	The agreement ensures the use of the latest technologies, versions and industry standards for CenturyLink Provided Equipment: ☑ Software ☑ Hardware ☑ Firmware ☑ Network ☑ Maintenance	Pages 34-39
☑	Sufficient connectivity with legacy network to allow for transparent communication between networks: ☑ Proper gateways for service providers ☑ PSAP to PSAP communications	Pages 13-14

Status	Requirement	Reference
☑	Meets or exceeds industry standards regarding: ☑ Network capabilities (to include last mile) ☑ NG911 Core Services ☑ Sufficiently handle call load without degrading quality of service	Pages 14-15
☑	Emergency call routing to the correct PSAP based on caller location; callback number and caller location are delivered to the PSAP with the call	Page 15
☑	Supports call originations from legacy wireline/wireless originating networks, as well as from VoIP callers and text messaging applications	Page 16
☑	Supports call originations from many different devices and services (e.g. SMS, IM, video PDSs, telematics, TTY/TDD, etc.)	Page 17
☑	IP-Enabled Equipment	Page 18
☑	Support (network and PSAP)	Pages 48-49
☑	Logging capabilities	Page 19
☑	Review of metrics and data provided by the ClearView Reporting tool	Pages 49-50
☑	Review of overall metrics as being necessary and sufficient to support the State's objective	Page 50
☑	Administrative line demarcation (New Checklist Requirement)	Pages 18-19
☑	Security of Managed Services (New Checklist Requirement) – Physical, Administrative, and Network Security including but not limited to NENA 75-001 (NG-SEC)	Pages 20-23

3. SOLUTION DESIGN

The CenturyLink Managed Services offering provides the Program with a geo-diverse, nationally hosted NG9-1-1 call routing and call handling solution. It includes several applications and services that will enable Arizona PSAPs to migrate to new technology in an operating expense model. The following table addresses beneficial features, vulnerabilities and recommendations for improving the solution design or its associated documentation.

Table 3 – Solution Design Review

Topic Area	Commentary	Reference
Ubiquitous – (eliminates or has the ability to eliminate communication boundaries, such as but not limited to service provider, LATA and state boundaries)		
NENA Network-of-Networks Vision	Meets requirements. The Managed Services offering may be viewed as a cloud-hosted, Software-as-a-Service (SaaS) model where the ESInet is a combination of hosted services in regional and national data centers, with interconnection of PSAPs over private, leased Multi-Protocol Label Switching (MPLS) networks. Participating PSAPs would be part of a nationwide CenturyLink/Intrado ESInet enabling ubiquitous call transfers of voice and data to any other PSAP on the CenturyLink/Intrado ESInet, regardless of local access and transport area (LATA) and state boundaries. Based on the referenced figure, it appears that the solution aligns with NENA's "network-of-networks" vision by providing interconnection with other i3 networks via the CenturyLink/Intrado-provided Border Control Function (BCF).	A9-1-1 Great Migration Plan for AZ, Appendix A, Figure 1, pg. 18
i3 Call Transfers	Unable to determine whether the solution meets requirements. Figure 1 from the referenced document indicates interoperability with other i3 networks. However, CenturyLink's documentation does not describe interconnection and interoperability with other networks. MCP recommends that the Program request additional documentation from CenturyLink that describes how the Managed Services solution will interconnect with other i3 networks, either in-state regional networks or neighboring state networks. The services description should identify transfer services that will be supported, which should include but are not limited to voice, text to 9-1-1, location data, supplemental data, call types, the i3 interface(s) and protocols that will be used, physical points of interconnect, and whether additional fees may apply for said interoperability.	A9-1-1 Great Migration Plan for AZ, Appendix A, Figure 1, pg. 18
Legacy Selective Router Transfers	Unable to determine whether the solution meets requirements. The referenced documentation states that the Managed Services offering should include legacy selective router call transfers and that CenturyLink will	AZ NG9-1-1 Technical Review 4-14-14, Section 7.2 & 7.3

Topic Area	Commentary	Reference
	work with alternative service providers to establish connectivity to other selective routers and automatic location identification (ALI) systems. However, the documentation does not definitively describe whether call transfers to/from PSAPs served by legacy selective routers (LSRs) will provide ALI data. **MCP recommends** that the Program request that CenturyLink provide additional language in Section 7.3 that describes the specific interfaces on calls, both in to and out of the system. The documentation should describe if ALI will be provided in call transfers to and from LSRs and switches, including those from alternative service providers. Any limitations to LSR call transfers, such as ALI only being available for certain call types, should be included in this section. The potential exists where alternative service providers may not be willing to connect to the LSRs or LNGs in Phoenix and Tucson, requiring CenturyLink to pick up their traffic at the alternative service provider's switch(es). As such, the Program should request that CenturyLink describe whether there are any additional costs associated with the connectivity and services described in Section 7.3.	
NENA i3 Compliant (current and future requirements)		
NENA i3 – General	Meets requirements. The Managed Services offering describes migrating PSAPs to i3 services and references all of the i3 functional elements, including i3 protocols and interfaces. **MCP recommends** that the Program obtain additional documentation on the specific services and features of the i3 Managed Services offering. **MCP recommends** that the Program obtain more details on the PSAPs' i3 migration process, the timing with making the move from legacy systems to i3, and any limitations of the service. Specific recommendations follow in the next six topic areas.	A9-1-1 Great Migration Plan for AZ – references throughout the document AZ NG9-1-1 Technical Review 4-14-14, Section 12 MCP Responses Set 1 sed
Emergency Call Routing Function (ECRF) and Location Validation Function (LVF)	Meets requirements. The ECRF and LVF descriptions provide information on the functions they serve at a high level. Additional information would be helpful in understanding the	AZ NG9-1-1 Technical Review 4-14-14, Section 12.1.1 A9-1-1 Great Migration Plan for AZ,

Topic Area	Commentary	Reference
	provisioning of these critical systems. **MCP recommends** that the Program obtain additional documentation from CenturyLink on what these components will provide to the PSAPs. At a minimum, the additional documentation should describe: the features that these systems will provide; how validations will be made; the interface to the Communication Service Providers (CSPs); how updates to the ECRF are performed; how the GIS data is managed/coalesced between all GIS data providers; how conflicts are managed between GIS data sources; what happens when a CSP's record cannot be validated; and the Internet Engineering Task Force (IETF) Request For Comments (RFC) for those functions that are in compliance.	Appendix A MCP Responses Set 1 sed
Emergency Services Routing Proxy (ESRP) and Policy Routing Function (PRF)	Meets requirements. The ESRP description provides insight to the general function of the element and its ability to route calls utilizing latitude/longitude, civic location or routing keys. The PRF description details the policies and processes that PSAPs will use for making updates to their routing policies. The description highlights features that exceed i3 functionality with alternative fallback routing methodologies that could be beneficial to the PSAPs. A topic that is not discussed in the referenced documentation, yet a key element of the ESRP, is queue management functionality. Basically, the ESRP and PRF work together to manage call queues from which terminating ESRPs (CPE in legacy terms) will pull calls from the queues to which PSAP(s) are subscribed. **MCP recommends** that the Program obtain additional documentation from CenturyLink on these components. At a minimum, the additional documentation should describe the interfaces that the ESRP will support, its queue management capabilities with the proposed call handling systems, and the IETF RFCs for those functions that are in compliance.	MCP Responses Set 1 sed
Location Information Server (LIS) and Call Information Database (CIDB)	Meets requirements.	MCP Responses Set 1 sed

Topic Area	Commentary	Reference
	The LIS and CIDB descriptions provide a logical solution to the issue of carriers not providing LIS and CIDB systems, which is an industry issue for the foreseeable future. The CenturyLink/Intrado solution solves a challenge that is not addressed in i3 and exceeds the requirements set forth in the standard.	
Event Logging Service	Meets requirements. The referenced documentation describes the i3 Event Logging Service at a high level. **MCP recommends** that the Program obtain additional documentation from CenturyLink on the event logging interface, call event log details, and the system's reporting capabilities.	MCP Responses Set 1 sed
Forest Guide	Unable to determine whether the solution meets requirements. The i3 Forest Guide service is not described in the CenturyLink documentation. The Forest Guide feature enables interoperability between i3 systems. **MCP recommends** that the Program obtain additional documentation from CenturyLink on the Managed Services' support for Forest Guide routing. At a minimum, the additional documentation should describe how the service will interface with a state-level and/or national Forest Guide and what IETF RFCs the system will support pertaining to Forest Guide.	Not applicable
i3 Guarantee	Meets requirements. The referenced documentation describes the Managed Services providing a guarantee to support "all functions and protocols specified in the NENA i3 reference architecture." The documentation speaks to a guarantee, but no remedies are described in the Intrado proposal. This provides two concerns: 1) the guarantee does not provide for remedies if the Managed Services do not support all i3 functions and protocols; and 2) the guarantee is made in Intrado's proposal document, not CenturyLink's. **MCP recommends** that the Program ask CenturyLink to define the remedies if	A9-1-1 Great Migration Plan for AZ, page 1, 2 and 4

Topic Area	Commentary	Reference
	the Managed Services do not support all i3 functions and protocols, i.e., what is the process for raising concerns regarding i3 compliance after Managed Services go live? **MCP also recommends** that the Program have the i3 Guarantee detailed in the appropriate CenturyLink document, such as the CenturyLink Services Agreement.	
	Unable to determine whether the solution meets requirements. The Great Migration Plan describes the i3 Guarantee in the context of Advanced 9-1-1 (A9-1-1) VIPER services, but it does not mention whether it applies to the Cassidian VESTA call handling solution. **MCP recommends** that the Program seek clarification from CenturyLink on whether the i3 Guarantee applies to the Cassidian VESTA call handling solution and its associated applications, such as Aurora, Data Sync, and Vela.	A9-1-1 Great Migration Plan for AZ, page 1 and 7
End-to-end IP signaling from VoIP endpoint to IP-enabled PSAP		
PSAP Gateway Manager (PGM) Terminal Server	Does not meet requirements. The referenced documentation indicates that the Managed Services will not provide for end-to-end IP signaling from VoIP endpoint to IP-enabled PSAP, at least initially. It states that PSAP gateway managers (PGMs) will convert IP traffic to centralized automatic message accounting (CAMA) signaling before delivering the call to the host call handling equipment. PGMs are required when interfacing with legacy CPE that is not IP capable. Both the VESTA and VIPER call handling systems are IP capable and have been deployed with the Request For Assistance Interface (RFAI), which provides IP call delivery in an Emergency Services Number (ESN)-based routing solution. Additionally, both systems have the ability to provide a NENA i3-compliant, IP interface. Other reasons to eliminate PGMs in the call flow include: • IP-to-Time Division Multiplexing (TDM) conversions increase the risk of echo • The use of PGMs adds latency to call setup	AZ NG9-1-1 Technical Review 4-14-14, Section 5.0, third bullet NG911 Managed Services - Arizona Network Diagram

Topic Area	Commentary	Reference
	• PGMs represent another potential point of failure in the call path • A system process for accommodating PGMs was the critical factor in the CenturyLink outage in Washington State on April 9-10, 2014 Based on the information above, **MCP recommends** that the Program require that CenturyLink remove PGMs from the hosted CPE solution design. This recommendation is made on the assumption that all PSAPs on the CenturyLink ESInet will have purchased the complete Great Migration solution. PGMs may be required for interfacing to other CPE systems on the ESInet and exceptions may be appropriate for PSAPs that do not use the bundled VIPER or VESTA solutions.	
Network Design		
Geo-diverse	Meets requirements. One of the strengths of the Managed Services offering is that it provides for geo-diversity throughout the solution design. Originating 9-1-1 traffic is delivered to two geographically diverse legacy network gateways (LNG) located in Phoenix and Tucson, Arizona. Meanwhile, the core intelligence and database elements of the solution are hosted in geographically diverse data centers in Englewood, Colorado, and Miami, Florida. This extreme geo-diversity provides improved survivability of the solution by assuring that a localized catastrophic weather or man-made event cannot take down both nodes. The geo-diverse design includes the host call handling systems. The VIPER hosts are located in the same Englewood and Miami data centers, while the VESTA hosts are located in Highlands Ranch, Colorado and Phoenix, Arizona. CenturyLink's solution design incorporates geo-diversity into the design of the local access for each of the aforementioned critical network elements, with each element having diverse local points of presence (POP) for accessing CenturyLink's nationwide MPLS network. Once the packets are "on net" the inherent quality of MPLS is that there are dozens of route combinations	NG911 Managed Services - Arizona Network Diagram

Topic Area	Commentary	Reference
	available to deliver each packet from point A to point Z.	
Redundant	Unable to determine whether the solution meets requirements. The Managed Services solution design provides redundant call path components throughout the design. • Originating traffic at each of the LSRs is redundantly connected to two LNGs • LNGs are redundant with locations in Phoenix and Tucson • Each LNG location has redundant IP routers connecting to redundant MPLS POPs • The MPLS network interconnects all network nodes with redundant virtual private networks (VPNs) • MPLS bandwidth is redundant to provide for 100 percent capacity in case of failure to one of the connections • Core databases and routing elements are redundant in Englewood and Miami • Redundant IP routers are provided at each core node • VIPER hosts are redundant in Englewood and Miami • VESTA hosts are redundant in Highlands Ranch and Phoenix • Redundant IP routers are provided at each VESTA host site • Redundant IP routers are provided at each PSAP location The documentation does not provide details as to the redundancy of critical support components such as the network operations center (NOC), monitoring systems, provisioning systems, backup systems, and data archive systems. Additionally, the referenced network diagram does not show redundant Layer 2 connectivity between the VESTA cores. **MCP recommends** that the Program request that CenturyLink provide details regarding the redundancy of support systems and the VESTA Layer 2 connectivity.	NG911 Managed Services - Arizona Network Diagram
	Unable to determine whether the solution meets requirements. The referenced document states “CenturyLink will provide dual, redundant, and	AZ NG9-1-1 Technical Review 4-14-14, Section 6.1

Topic Area	Commentary	Reference
	diverse IP connectivity via the CenturyLink provided iQ MPLS private port from the ECMC to the PSAP as available." **MCP recommends** that the Program request that CenturyLink provide details where redundant and diverse IP is not available to the PSAP. **MCP recommends** that the Program request detailed network mapping down to the card level to ensure that there is no single point of failure.	
Sufficient connectivity with legacy network to allow for transparent communication between networks - Proper gateways for service providers	Meets requirements. Similar to today's LSRs, the Managed Services offering provides for two redundant, geographically diverse LNGs located in Phoenix and Tucson. These gateways provide proper interconnection to the ESInet for legacy TDM traffic. CenturyLink's recommendation for the ingress network to the gateways calls for a ratio of 1.3 trunks for every LSR-to-PSAP trunk, with the caveat that they will monitor traffic volumes and adjust the ratio up/down accordingly. This recommendation is the industry norm and appropriate for the Arizona deployment. A topic that was not addressed in the CenturyLink documentation is the ability for the solution to accept calls from CSPs via native Session Initiation Protocol (SIP). The standard for the SIP call delivery to an ESInet is under development, which is likely the reason that this topic was not discussed. However, during the course of the next five years, it is anticipated that the standard will be ratified and carriers will be ready to deliver their calls via SIP. Therefore, **MCP recommends** that the Program request that CenturyLink provide a service description in the consolidated Services Agreement detailing the points of interconnect (POI) for SIP call delivery and the process for migrating carrier traffic from the gateways to the SIP POI.	AZ NG9-1-1 Technical Review 4-14-14, Section 11.0 "As a PSAP is migrated to a NG PSAP, CenturyLink will replace the existing EM trunks from the Legacy Selective Router (LSR) to the PSAP with SR trunks from the LSR to the LNG Gateways. CenturyLink's recommended design will be a ratio of (1.3) ES trunks for every (1) legacy EM trunk. During the migration of PSAPs from the legacy network to the ESInet, CenturyLink will monitor the traffic volumes and may adjust this ratio up or down as needed. Additionally, trunks from the LNG to the LSR are needed to support call transfers from NG PSAPs to Legacy PSAPs or vice versa, which may also impact the required ratio."
Sufficient connectivity with legacy network to allow for transparent communication between networks – PSAP-to-PSAP communications	Meets requirements. The referenced documentation describes the requirement for LNG-to-LSR trunks for the purposes of call transfers between legacy and NG9-1-1 PSAPs. As one-directional TDM trunks, the minimum capacity that could be installed is	AZ NG9-1-1 Technical Review 4-14-14, Section 11.0 "Additionally, trunks from the LNG to the LSR are needed to support call

Topic Area	Commentary	Reference
	a Digital Signal 1 (DS1) circuit, which would provide for up to 24 simultaneous call transfers, i.e., 24 calls may be transferred via a DS1 from the LSR to the LNG and 24 calls may be transferred via a DS1 from the LNG to the LSR at any single given point in time. Similar to the commitment to monitoring CenturyLink's ingress network trunk capacity, **MCP recommends** that the Program request that CenturyLink add a commitment to the consolidated Services Agreement for monitoring the call transfer volumes and adjusting capacity accordingly.	transfers from NG PSAPs to Legacy PSAPs or vice versa, which may also impact the required ratio."
Meets or exceeds industry standards - Network capabilities (to include last mile)	Unable to determine whether the solution meets requirements. The Managed Services offering meets industry standards for network capabilities by providing redundant and diverse MPLS connectivity to each network element, including PSAPs where feasible. Each network node has redundant edge routers terminating the IP connectivity. The network is advertised as using leading network protocols for management of IP traffic and providing fast convergence of the networks should an issue be experienced with one of the network paths. Redundant and diverse VPNs provide for isolation of traffic. The network is proactively monitored and alarms are sent to the CenturyLink NOC for investigation and troubleshooting. The network supports Quality of Service (QoS) for packet prioritization and security is implemented on the network. However, in response to MCP's request for last mile diagrams, CenturyLink stated that "CenturyLink network maps are proprietary and due to competitive and security issues, CenturyLink will not provide last mile diagrams of the last mile facilities. However, upon request, CenturyLink will allow MCP to view these maps at a CenturyLink facility. No photos, notes, or drawings will be allowed." The Task Order timeline did not provide for the opportunity for MCP to travel to a CenturyLink facility to review their available maps. As such, **MCP recommends** that the Program take CenturyLink up on the offer to view last mile network maps and take note of which POPs, data centers, and PSAPs have last mile network diversity challenges. This information will be valuable in understanding limitations of the network. With this information, the Program will be enabled to work with vendors to develop network diversity to locations, as feasible and appropriate.	AZ NG9-1-1 Technical Review 4-14-14, Sections 5.0, 6.0, 8.0, 13.6, 13.7 MCP Responses Set 1 sed, Answer 3

Topic Area	Commentary	Reference
Meets or exceeds industry standards - NG911 core services	Meets requirements. The referenced documentation describes all of the core i3 functional elements, their feature functionality, and the protocols/interfaces required of those systems. The referenced materials describe these functions for the core services and for the VIPER solution. These descriptions, as well as the i3 Guarantee (if backed up with significant remedies), provide the Program with assurance that the Managed Services offering will meet industry standards for NG9-1-1 core services. **MCP recommends** that the Program request that CenturyLink consolidate all of the NG9-1-1 service descriptions into a single section within the consolidated Services Agreement. Additionally, **MCP recommends** that the Program request documentation and commitment from CenturyLink regarding the Cassidian VESTA's support for NENA i3 protocols and interfaces. This should be addressed in the updated i3 Guarantee SLA.	A9-1-1 Great Migration Plan for AZ, pg. 4 and Appendix A MCP Responses Set 1 sed, Answer 1
Meets or exceeds industry standards - Sufficiently handle call load without degrading quality of service	Meets requirements. The referenced sentence commits to the MPLS network providing the industry standard P.01 grade of service, which correlates to no more than one blocked call out of 100 in busy hour traffic. This commitment, combined with the use of the *de facto* industry standard 1.3 ratio for ingress trunks to the ESInet and the monitoring of ingress traffic, leaves MCP to believe that the network meets industry standards and that it is designed to sufficiently handle call load without degrading quality of service.	AZ NG9-1-1 Technical Review 4-14-14, Section 6.2 "The CenturyLink provided iQ MPLS private port will meet the industry standard P.01 grade of service. P.01 will be applied from CenturyLink sites to the PSAP over the CenturyLink supplied network."
Emergency call routing to the correct PSAP based on caller location; callback number and caller location are delivered to the PSAP with the call	Unable to determine whether the solution meets requirement. The Managed Services offering provides for emergency calls to be routed to the correct PSAP based on the caller's location, either through a legacy selective routing feature or through an i3 geospatial routing feature. However, not all situations will provide for the call back number and caller location to be delivered with the call. This is not due to a limitation of the solution design, but rather a reality of today's limitations in the delivery of location with the call from the originating networks, limitations in the wireless location acquisition technology, and standards-based call processing models.	Not Applicable

Topic Area	Commentary	Reference
	i3 call delivery includes the callback number in the SIP INVITE and provides for the ability to deliver caller location with the call. However, in Location-by-Reference (LbR) scenarios such as wireless calls, the call may be dereferenced prior to call delivery, but in most cases, the location may be that of the cell site and call routing will have to be performed on the cell site or cell sector's centroid location. In some cases, a location universal resource identifier (URI) may be provided to the CPE and it may have to be dereferenced after the call is delivered. In both cases, a "rebid" by the CPE will send a Hypertext Transfer Protocol (HTTP)-Enabled Location Determination (HELD) dereference query to attempt to obtain a more accurate Phase II location for the caller. In some cases, Phase I location may only be available. However, in these i3 LbR calls, the CPE may be able to automatically perform the HELD query to obtain location data in parallel to the call setup process with the remote PSAP workstation. It is anticipated that the callback number and caller location (minimum Phase I) will be delivered with the call to the workstation in a vast majority of calls. Calls delivered via RFAI will not provide caller location on call delivery to the host CPE, as the call setup is based on ESN-based routing with a subsequent ALI query to retrieve location information. However, in these RFAI calls, the CPE will query ALI and should obtain ALI data in parallel to the call setup process with the remote PSAP workstation. It is anticipated that the callback number and caller location (minimum Phase I) will be delivered with the call to the workstation in a vast majority of calls. **MCP recommends** that the Program confirm the standards-based assumptions above and how much of the location retrieval function will take place before the call is presented to the PSAP, as these details were not provided in the documentation for this assessment.	
Supports call originations from legacy wireline/wireless originating networks, as well as from VoIP callers and text messaging applications	Meets requirements. The Managed Services offering supports call originations from legacy wireline, wireless, voice over IP (VoIP) and text messaging applications; specifically short message service (SMS) text.	AZ NG9-1-1 Technical Review 4-14-14, Section 7.1 "Next Gen 9-1-1 Routing allows for specialized management of wireline,

Topic Area	Commentary	Reference
	In April 2013, the Alliance for Telecommunications Industry Solution (ATIS) and the Telecommunications Industry Association (TIA) released J-STD-110 Joint ATIS/TIA Native SMS to 9-1-1 Requirements and Architecture Specification. This industry standard "defines capabilities necessary to support SMS to 9-1-1, including standardized interfaces from the originating network to the PSAP, obtaining coarse location for routing, handling bounce-back messages, and managing the text message dialog between the originator and PSAP." The Intrado solution advertises its abilities to provide an i3 interface with its call handling application, Power 911. Additionally, the solution provides a Web-browser for text delivery to the CPE that is not text enabled. Cassidian stated that it plans "to support text messaging when these standards are determined and approved by NENA. Once this is approved and offered by Cassidian, CenturyLink will make this optional feature available to the PSAP." MCP understands that NENA views J-STD-110 as the industry standard defining emergency SMS delivery via Message Session Relay Protocol (MSRP) to PSAP CPE. The NENA i3 standard states that call handling equipment must support MSRP. **MCP recommends** that the Program require that the Cassidian solution provide text delivery directly to the call handling user interface (UI). This will enable call takers to process text messages in the call taking UI without the need for a separate window. This should also provide for consolidated voice and SMS management information systems (MIS) reporting.	wireless, and VoIP call types. Call types are determined based on the incoming call source facility (e.g. MSC, End office), as well as, the information provided within call signaling." A9-1-1 Great Migration Plan for AZ, pg. 8 ▪ "Converts SMS messages incoming from the wireless carrier/SMS aggregator to the SIP dialogue" MCP Responses Set 1 sed, Answer 4 http://www.atis.org/PRESS/pressreleases2013/040213.asp
Supports call originations from many different devices and services (e.g., SMS, IM, video PDSs, telematics, TTY/TDD, etc.)	Meets requirements. The referenced documentation advertises the capability of the Managed Services offering for supporting many different sources of systems such as SMS, multimedia service (MMS), hazardous materials data, floor plan, and gunshot detection data; the system also supports legacy teletypewriter/telecommunications device for the deaf (TTY/TDD).	A9-1-1 Great Migration Plan for AZ, page 9 and 15

Topic Area	Commentary	Reference
	Additional Data is an area that is under standards development with NENA i3 v2, which is anticipated to be released sometime in 2014 with more standards development work that will carry into the standard's future versions. The Program should expect that call origination from sources other than the Great Migration bundled services of voice, SMS, MMS and TTY/TDD may incur additional fees for the services. However, the i3 Guarantee (with suggested remedy revisions) provides the Program with assurance that the system will comply with all current and future i3 systems, interfaces, and protocols for processing all i3 call/data types.	
IP-Enabled Equipment	Meets requirements. The VIPER and VESTA systems are industry leading IP-enabled call handling systems with the two platforms providing a majority of the call processing across the United States. These systems are able to process native SIP call delivery, eliminating TDM transport once the call reaches the ESInet.	http://www.cassidiancommunications.com/pdf/PB_Vesta_Sentinel4.pdf A9-1-1 Great Migration Plan for AZ, page 7
Administrative Line Demarcation (New Checklist Requirement)	Meets requirements. The referenced documentation is the first mention of the demarcation for administrative (admin) lines to the hosted call handling systems. In the industry, Foreign Exchange Office (FXO), Foreign Exchange Subscriber (FXS), and T1 gateways provide for the integration of admin lines with the PSAP CPE. Therefore, MCP deciphers the description of "Gateways (FXO, FXS, and T1)" to indicate that the PSAP's admin lines will be terminated locally at each PSAP. Termination of admin lines at the remote PSAP provides benefits and limitations to the features of a host/remote solution. As described with having admin lines terminating at the remote PSAP, the solution provides a secondary level of survivability in that if the MPLS network connectivity to the system is lost, then NG9-1-1 routing rules may be capable of being provisioned to send the 9-1-1 calls to a public switched telephone network (PSTN) number, e.g., the locally terminated PSAP admin lines. A potential limitation of the admin line design is that it may provide for the	AZ NG9-1-1 Technical Review 4-14-14, Sections 15.4 and 7.1

Topic Area	Commentary	Reference
	capability to send admin lines to multiple physical locations, which is a beneficial feature when a PSAP would like to spread its call takers over multiple locations. However, this feature would be enabled if the solution is designed to have the capability to backhaul the admin lines back to the core host sites and then deliver the calls to other destinations. **MCP recommends**, given this speculation of benefits and features, that the Program request a list of features and limitations of the admin line solution design.	
Logging Capabilities	Meets requirements. The referenced documentation describes analog output of position audio for recording of all position-based audio, e.g., 9-1-1 calls, administrative calls, and radio transmissions for both the VIPER and VESTA call handling solutions. The referenced documentation identifies an IP recording solution for the Intrado VIPER solution, which requires IP taps at each VIPER node. Based on the Third-Party IP-Recording Kit description, it appears that the logging device would have to be collocated with the VIPER nodes. This leaves questions about the ability to host third party loggers; to access log files; and to correlate them with admin line and radio traffic, as well as the maintenance and service of those systems. These questions may be offset with the option for having a cloud-hosted logging recorder solution that is briefly described in the referenced documentation. The documentation should also clearly delineate whether the Managed Services will also provide functionality for instant recall recording (IRR) of communications media. IRR provides limited instant playback of phone, radio and other media traffic, and is typically accessible at every PSAP operational position. Lastly, CenturyLink identifies that the NENA i3 specifications for logging are still under development and that the Intrado solution will support the future i3 specification. In summary, CenturyLink has presented the following logging capabilities: 1. VIPER – Analog, position-side recording of radio, administrative line and 9-1-1 traffic 2. VIPER – IP packet recording at each VIPER node. Radio and admin lines would be recorded separate of the 9-1-1 calls by the logging recorder; as a result, correlation between 9-1-1 and radio transmissions would have to be performed independently. It is unclear whether the	MCP Responses Set 1 sed, Answer 6 PBN-2013-Third Party IP-Recording Kit

Topic Area	Commentary	Reference
	Managed Services will support this solution due to the VIPER nodes being hosted at Intrado data centers 3. VIPER – cloud-hosted, multi-vendor logging recorder options available 4. VIPER – future i3 logging interface VESTA – Analog, position-side recording of radio, admin line and 9-1-1 traffic The position-side, analog recording option provides for a ubiquitous logging solution across both call handling solutions. With the NENA i3 logging specifications standing undefined, **MCP recommends** that Arizona PSAPs utilize the analog, position-side recording option until an i3 logging solution becomes available. Additionally, **MCP recommends** that the Program require CenturyLink to provide details on the cloud-hosted logging recorder options, the features that they provide, and the associated costs so that PSAPs may consider those options when considering the Managed Services offering. **MCP recommends** that the Program request that research be conducted prior to implementing a cloud-hosted logging solution, to assure continued compliance with all State and local laws regarding retention, access and storage of communications records.	
Security of Managed Services (New Checklist Requirement)	Meets requirements. As Arizona PSAPs make the move to NG9-1-1, the importance of security of the 9-1-1 system drastically increases. The legacy network is a closed system with controlled access through defined entry points. While much of this holds true for the ingress network, the ESInet is inherently an IP network consisting of a multitude of logical access points. With this in mind, NENA has developed the Security for Next-Generation 9-1-1 Standard (NG-SEC, NENA 75-001). While not all NG-SEC requirements may apply to the Managed Services offering, it provides a baseline set of requirements for consideration in defending the PSAP's 9-1-1 services from security threats. The referenced documentation provides great insight to the approach to the security of the Managed Services offering. The layering tactic of a defense-in-depth security strategy is used by the world's top information security offices and it appears that the CenturyLink solution provided by Intrado has a strategy	MCP Responses Set 1 sed, Answer 7

Topic Area	Commentary	Reference
	that is well built to defend the ESInet from malicious attacks. It is encouraging that the solutions provider is an active participant in Network Reliability and Interoperability Council (NRIC) 7 focus group 2B Cyber-Security and that its cybersecurity policies, standards, and guidelines are compliant with industry best practices as defined by International Organization for Standardization and Control Objectives for Information and related Technology (COBIT). Highlights of the security for the solution include: • Multi-layer Security Strategy • Physical Security o Logical access o Physical access o System power o Geographic separation of core systems o Background checks • Network Security o Intrusion prevention/detection systems o Data/network segmentation o Role-based access o Access control lists o Stateful packet inspection firewalls o Session border controllers o Encryption o Two-factor authentication access o Vulnerability scans o Monitoring • Data security o Role-based access o Separate provisioning/production datasets o Two-factor authentication access o Separate development environment from production o Anti-virus/Anti-malware o Patch management o Server hardening	

Topic Area	Commentary	Reference
	MCP recommends that the Program request that CenturyLink provide a report on the Managed Services offering's compliance with NG-SEC NENA 75-001. As stated previously, there may be areas that are not applicable to the solution. **MCP recommends** that the report detail what alternative preventative measures are in place to address the intent of the NG-SEC requirement for any areas where the solution is not compliant with NENA 75-001. In many cases, the solution may exceed the requirements of NG-SEC. Operationally, industry best practices provide for separation of security and network operations. **MCP recommends** that the Program request that CenturyLink describe whether there is a Security Operations Center (SOC), or a functional equivalent, that carries out the tasks above. The description should detail the hours of operation of the SOC, the metrics and reports that are monitored, and whether those reports may be made available to the Program and PSAPs.	
	Unable to determine whether the solution meets requirements. **MCP recommends** that the Program request that CenturyLink provide details in the consolidated Services Agreement defining "appropriate levels of security," "industry standard security procedures," and "security measures." This may be a reference to new content describing the security of the solution as provided in the follow-up documentation received on May 20, 2014. **MCP recommends** that the Program require that CenturyLink add security levels, with specific reporting and timeframes, to the SLA. Lastly, **MCP recommends** that the Program require that CenturyLink perform background checks on all staff that have access to the system, including sub-contractors.	AZ NG9-1-1 Technical Review 4-14-14, Section 6.2 Bold formatting applied by MCP to highlight the statements referenced: "The iQ MPLS private port will have the **appropriate levels of security** in place both at the physical and application layers." "The CenturyLink provided iQ MPLS private port will have the **appropriate levels of security** in place both at the physical and application layers, as determined within IPP. CenturyLink will secure the CenturyLink-provided iQ MPLS private port using **industry standard security procedures** against security attacks from other

Topic Area	Commentary	Reference
		networks or the public Internet. "CenturyLink will **employ security measures** where a PSAP may have dual-homed CPE (connected to both the CenturyLink solution and another service provider's network)."
PAD	Meets requirements. The referenced material discusses the installation and testing procedures for the PSAP abandonment device (PAD). The solution appears to add value and provide an important service to PSAPs, as it provides PSAP personnel with the ability to self-initiate the abandonment process without having to engage technical support. The device will provide a lamp indicator showing that the PSAP is abandoned, which provides the PSAP's leadership with comfort in knowing their PSAP abandonment status without having to call the NOC. The Technical Review document does not discuss the PAD. **MCP recommends** that the Program request that the PAD be described in a consolidated Service Agreement (see **Service Agreement Updates** section below) stating that it will be installed at all PSAPs. **MCP recommends** that all PSAPs contracting for the Managed Service have the PAD installed to ensure uniform service across the state.	PAD MOP CenturyLink Work and Testing Instructions 102313CH Final
PowerProbe Servers	Unable to determine whether the solution meets requirements. The referenced material discusses the features and benefits of the PowerProbe network metrics devices. PowerProbe provides a solution for measuring call quality in an IP network such as that which is proposed by CenturyLink. The solution design calls for centralized PowerProbe servers that reach across the ESInet to the PowerProbe 30 Responder device, which provides network performance statistics. Based on our experience in other similar deployments, **MCP recommends** that the PowerProbe servers be located at the network core in order to produce the most reliable call quality metrics. This will enable mean opinion score (MOS) metrics to be taken from the point where the media is	PowerProbe6000AndPowerProbe500_CCW-20472-0_DS_NM_0

Topic Area	Commentary	Reference
	anchored through the MPLS networks to the PSAP edge. The Technical Review document does not discuss the PowerProbe. **MCP recommends** that the Program request that the PowerProbe metrics be described in a consolidated Service Agreement stating the services that will be provided in the Managed Services offering. Details should include what metrics (if any) will be made available to the Program and PSAPs. Will metrics be available on an ad hoc, per call basis or in consolidated daily/weekly/monthly reports?	
System Backup	Unable to determine whether the solution meets requirements. MCP was unable to find any information in the provided documentation on how each of the systems will be backed up. **MCP recommends** that the Program require that CenturyLink provide details for system backup. These details should be provided in the consolidated Services Agreement with information on what systems are backed up; the frequency of backups; and the process for change management, backup retrieval and restoration.	All documentation
Local GIS data management with each of the nineteen 9-1-1 systems. "Confirmation is needed that the Managed Services solution provides for: 1) Each 9-1-1 community to load their GIS locally."	Unable to determine whether the solution meets requirements. The referenced documentation states that the goal of the Managed Services is to "create and maintain the authoritative GIS database for 9-1-1 purposes." The documentation speaks to the ability of agencies to maintain their GIS data with their existing tools and loading the GIS data in to an agreed upon mechanism. The solution description does not detail the options available and how the disparate GIS datasets will be integrated with the new system. **MCP recommends** that the Program require CenturyLink to provide additional detail in the consolidated Services Agreement regarding the tools, processes and limitations related to the sharing and coalescing of 19 GIS datasets into an enterprise GIS database.	NG9-1-1 Core Services and mapping solutions questions from email sent by Sandra Gilstad received on May 20, 2014 A9-1-1 Great Migration Plan for AZ, pages 6-7
Local GIS data management with each of the nineteen 9-1-1 systems.	Unable to determine whether the solution meets requirements.	NG9-1-1 Core Services and mapping solutions questions from email sent by

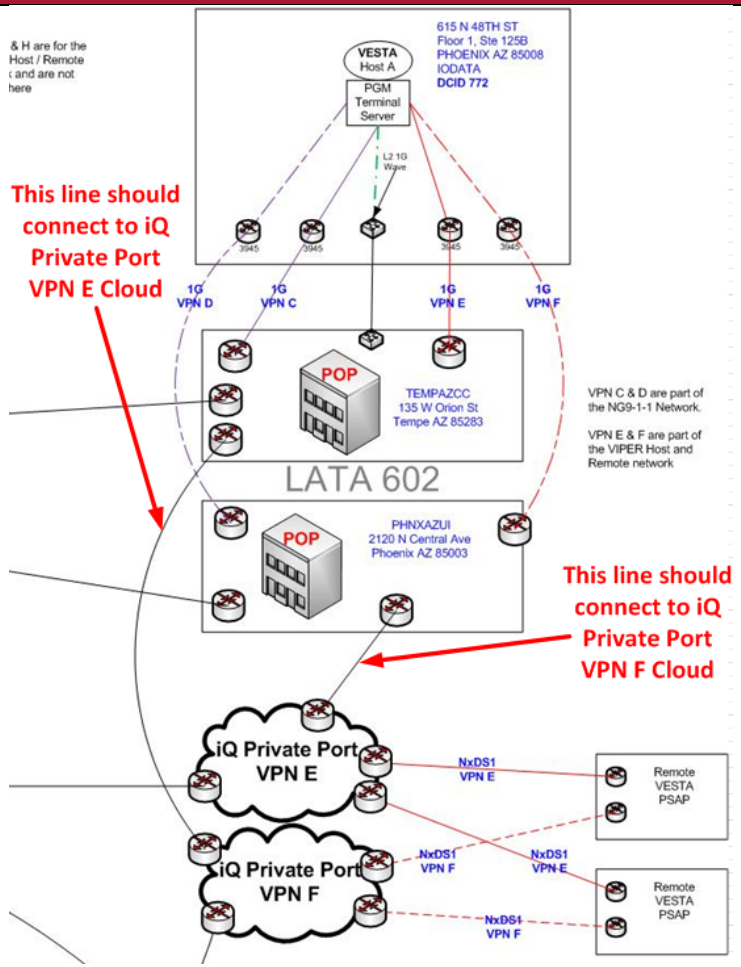
Topic Area	Commentary	Reference
"Confirmation is needed that the Managed Services solution provides for: 2) At the level of the SIF/ECRF/LVF, that the local GIS data can be field mapped to an NG GIS data schema so that mass overhauls of local GIS data isn't required."	The State will likely have a variety of GIS data schemas due to its nineteen 9-1-1 systems in the state. The CenturyLink documentation does not describe any GIS data schema requirements and if the solution provides for field mapping of data fields to align the 19 GIS datasets into a single authoritative GIS database. **MCP recommends** that the Program require CenturyLink to provide additional detail in the consolidated Services Agreement describing the ability of the Managed Services to field map the GIS data schema so that the nineteen 9-1-1 systems may continue to manage their GIS data as they do today. The solution description should describe any limitations to unique field mapping for up to 19 data sources.	Sandra Gilstad received on May 20, 2014
"Enterprise map updates to be provided to each PSAP."	Unable to determine whether the solution meets requirements. The referenced documentation describes single GIS servers being located at each VIPER and VESTA call handling system host site, with local GIS application servers at each remote PSAP. The documentation does not describe the process in which the call handling maps will be updated for each call handling system. **MCP recommends** that the Program require CenturyLink to provide additional detail in the consolidated Services Agreement describing the process for updating the remote GIS application servers. The Services Agreement should describe how the solution will support a state-level, enterprise map that publishes updates to multiple call handling host systems, which then feed each of the remote PSAPs' GIS application servers. Limitations and assumptions of the Managed Services should be stated in the consolidated Services Agreement.	NG9-1-1 Core Services and mapping solutions questions from email sent by Sandra Gilstad received on May 20, 2014 AZ NG9-1-1 Technical Review 4-14-14, Sections 15.3, 15.4 and 15.5
Network Diagram/Description Edits		
Ingress Network Design	Does not meet requirements. The referenced section suggests that each call will be selectively routed twice; once by the LSR and then again by the NG9-1-1 routing solution. **MCP recommends** that the Program request that CenturyLink incorporate a	AZ NG9-1-1 Technical Review 4-14-14, Section 11 "As the PSAP is migrated to a NG PSAP, CenturyLink will update the routing in its LSR and based on ESN,

Topic Area	Commentary	Reference
	solution design that enables CSPs to direct connect to LNGs. This is the preferred method for delivering calls to the ESInet, as it eliminates a hop in the call path; it eliminates the maintenance of LSR records; and it eliminates the potential for CenturyLink to invoice for LSR services.	deliver the call over the EM trunks to a legacy PSAP or over the SR trunks to the LNG and then over the ESInet to a NG PSAP."
Egress Network Design	Unable to determine whether the solution meets requirements. **MCP recommends** that the Program require that CenturyLink insert a statement to the effect of "Regardless of bandwidth sizing, the Managed Services fees will provide for the bandwidth required to deliver services between the host CPE sites and each PSAP." The current language makes this assumption; it would be favorable to the PSAPs to have this commitment in the consolidated Services Agreement.	AZ NG9-1-1 Technical Review 4-14-14, Sections 13.7.2 & 13.7.4 "CenturyLink and Intrado will determine the exact required bandwidth each PSAP will require after site survey and call flow meeting has been conducted. Remote PSAP bandwidth above is only for estimating Host bandwidth requirements."
Data center bandwidth and ECMC to VIPER configuration	Unable to determine whether the solution meets requirements. The referenced material does not specify bandwidth allotment between the Intrado Emergency Call Management Complex (ECMC) data centers in Miami and Englewood. In review of the solution design, MCP sees the most resilient solution design as the one that provides either ECMC with the ability to set up calls with either VIPER host. For example, the Miami ECMC may send calls to the Englewood VIPER in situations where the Miami VIPER is down and vice versa. The referenced diagram indicates that the Miami ECMC only delivers calls to the Miami VIPER and the Englewood ECMC only delivers calls to the Englewood VIPER. If represented accurately, this configuration would be detrimental to the solution's availability, as a failure of either VIPER or ECMC would effectively take down the availability of its collocated partner ECMC or VIPER system. **MCP recommends** that the Program request clarification from CenturyLink on the ECMC/VIPER solution design and the bandwidth requirements between the Miami and Englewood data centers. A meshed configuration between the ECMCs and VIPERs is recommended. MCP believes that it is the intent that VPNs C & D provide the meshed connection between ECMCs and VIPERs;	AZ NG9-1-1 Technical Review 4-14-14, Section 13.6 NG911 Managed Services - Arizona Network Diagram

Topic Area	Commentary	Reference
	however, the VPNs between the ECMCs and VIPERs are not labeled on the referenced diagram.	
	Unable to determine whether the solution meets requirements. Per the discussion immediately above, **MCP recommends** that the Program have CenturyLink update the referenced diagram to depict the iQ Private Port VPN C & D clouds connecting the two ECMCs.	AZ NG9-1-1 Technical Review 4-14-14, Diagram above Section 14.4
VPN C & D	Unable to determine whether the solution meets requirements. In the referenced documentation, MCP believes that VPNs C & D are not only local, but provide connectivity between data centers and POPs. **MCP recommends** that the Program confirm this understanding and if true, request that CenturyLink delete the word "local" in the second bullet in Section 14.4, as the VPNs provide connectivity beyond the local ECMC and VIPER node.	AZ NG9-1-1 Technical Review 4-14-14, Section 14.4 NG911 Managed Services - Arizona Network Diagram
Inter-VIPER Network	Unable to determine whether the solution meets requirements. The referenced VIPER diagram shows a network connection between VIPER primary node and VIPER secondary node. This network connection and its associated bandwidth are not discussed in the Technical Review document, nor is it depicted in the NG911 Managed Services – Arizona Network Diagram. **MCP recommends** that the Program seek clarification from CenturyLink on whether this network connection will be provided in the Managed Services offering. If it is required, then CenturyLink should update the diagrams to reflect this connectivity and add language to the consolidated Services Agreement detailing the bandwidth required between the two systems. **MCP recommends** that this connectivity be on separate VPNs similar to the rest of the solution design.	AZ NG9-1-1 Technical Review 4-14-14, VIPER Diagram titled "Multi-Node" above Section 15.3
VIPER Configuration	Unable to determine whether the solution meets requirements. The referenced diagram depicts the VIPERs in a primary/secondary configuration. An active-active solution design combined with a meshed configuration with the ECMCs will enable both systems to be continually active in processing calls between both ECMCs for all PSAPs. This configuration assures the Program that provisioning and network connectivity is always being	AZ NG9-1-1 Technical Review 4-14-14, VIPER Diagram titled "Multi-Node" above Section 15.3

Topic Area	Commentary	Reference
	used and therefore tested. The Program and Arizona PSAPs do not want any system or network connection to ever sit idle, as that creates opportunities for systems to become out of synchronization and circuits to run the risk of being decommissioned due to inactivity. **MCP recommends** that the Program inquire with CenturyLink as to the VIPER configuration to ensure that either node is constantly processing calls in a balanced manner between ECMCs, and that both sites will be sized to process 100 percent of the expected calls with room for future expansion. The details of the CenturyLink response should be reflected in the consolidated Services Agreement.	
VESTA Configuration	Unable to determine whether the solution meets requirements. The referenced diagram depicts main and backup sites. Per the discussion immediately above, **MCP recommends** that the Program seek clarification from CenturyLink as to whether the VESTAs are configured as active-active or in a primary/secondary configuration, and that both sites will be sized to process 100 percent of the expected calls with room for future expansion. The details of the CenturyLink response should be reflected in the consolidated Services Agreement.	AZ NG9-1-1 Technical Review 4-14-14, VESTA Diagram below Section 15.2
VESTA Host Site Consoles	Does not meet requirements. The referenced diagram shows consoles at host sites. This will not be the case. **MCP recommends** that the Program request that CenturyLink update the diagram to accurately reflect the services/systems that will be deployed.	AZ NG9-1-1 Technical Review 4-14-14, VESTA Diagram below Section 15.2
IP Routers	Unable to determine whether the solution meets requirements. In the referenced diagram, it appears that the IP routers located in each location are logical representations and not physical representations. As such, **MCP recommends** that the Program request that CenturyLink confirm this interpretation and if correct, then request that CenturyLink add a note to the diagram with an explanation of logical representation of routers.	NG911 Managed Services - Arizona Network Diagram
Tempe POP and VPN A	Unable to determine whether the solution meets requirements.	NG911 Managed Services - Arizona Network Diagram

Topic Area	Commentary	Reference
	In the referenced diagram, the Tempe POP in the left, middle section of the diagram in LATA 602 shows VPN A ingress to the Tempe POP, with its egress connectivity to the iQ Private Port VPN B cloud. MCP believes that this is an error and the egress connectivity from this POP should connect to the iQ Private Port VPN A cloud. **MCP recommends** that the Program inquire with CenturyLink about this potential error and if confirmed, request that CenturyLink provide an updated diagram.	
VPN E & F	Unable to determine whether the solution meets requirements. In the referenced diagram, MCP believes that the VPN E & F notes to the right of the Englewood data center and below/right of the Phoenix VESTA host (in the upper right corner) should be updated to state "VPN E & F are part of the ***VESTA*** Host and Remote network." It currently reads "VPN E & F are part of the ***VIPER*** Host and Remote network." **MCP recommends** that the Program inquire with CenturyLink about this potential error and if confirmed, request that CenturyLink provide an updated diagram.	NG911 Managed Services - Arizona Network Diagram
Phoenix VESTA Host Connections to VPNs E & F	Unable to determine whether the solution meets requirements. In the referenced diagram, VPN E connects from the Phoenix VESTA host to the Tempe POP, which connects to the iQ Private Port VPN F cloud. Similarly, VPN F connects from the Phoenix VESTA host to the Phoenix POP, which connects to iQ Private Port VPN E cloud. MCP believes that the Tempe POP should connect to VPN E cloud and the Phoenix POP should connect to VPN F cloud.	NG911 Managed Services - Arizona Network Diagram

Topic Area	Commentary	Reference
	 **MCP recommends** that the Program inquire with CenturyLink about this potential error and if confirmed, request that CenturyLink provide an updated diagram.	
VESTA Layer 2 Connection	Unable to determine whether the solution meets requirements. Discussed in “Redundant” topic area above.	NG911 Managed Services - Arizona Network Diagram

Topic Area	Commentary	Reference
	The referenced diagram shows a single Layer 2, one gigabit per second (Gbps) connection between the two VESTA host sites. **MCP recommends** that the Program inquire with CenturyLink to determine whether the Layer 2 connection is mission critical. It is recommended that the Program ask CenturyLink for a cost/benefit analysis of providing redundant Layer 2 connectivity between the hosts given that there may be a significant cost increase to add a redundant connection. The VESTA systems may have processes in place at the host sites that provide for delayed synchronization if the Layer 2 network connection is severed. However, if the connectivity is mission critical, then it is advised that the VESTAs have redundant connectivity via diverse POPs.	
Primary/Secondary VPNs	Unable to determine whether the solution meets requirements. MCP believes that the referenced diagram indicates that there are primary and secondary VPNs between all components in the network. Active-Active path management provides the greatest level of reliability to ensure that no equipment or route path is ever sitting stagnant. **MCP recommends** that the Program request that CenturyLink explain whether the Primary/Secondary VPN configuration is accurate and if so, how the solution is configured so that load balancing is achieved across all components, VPNs, and IP routers for every PSAP, to enable a fully meshed solution where no component or path is stagnant.	NG911 Managed Services - Arizona Network Diagram

Topic Area	Commentary	Reference
CenturyLink Washington Outage	The CenturyLink/Intrado A9-1-1 outage that occurred on April 9-10, 2014, has raised concerns regarding the proposed solution design. Upon reading the referenced outage report, **MCP recommends** that the Program request an alarm audit be performed and its results be shared with the Program. Additionally, **MCP recommends** that the Program request a report of findings resulting from Intrado's A9-1-1 architecture review. **MCP recommends** that the Program request that CenturyLink share the corrective actions that are being taken to address NOC-to-NOC challenges. Lastly, **MCP recommends** that the Program request that CenturyLink assure the Program that lessons learned from the ingress trunking configuration in Washington be applied to the network design for Arizona, and that diagrams be updated with accompanying notes detailing what updates were made to the proposed solution design.	CenturyLink Major Outage Report to the Washington Utilities & Transportation Commission: http://wa-bainbridgeisland.civicplus.com/AgendaCenter/ViewFile/Item/382?fileID=1386

The solution design calls for a cloud-hosted, managed services solution that incorporates the latest technology and industry standards. Proper levels of redundancy and diversity are incorporated into the network and system designs, which should provide for a fully fault-tolerant solution. MCP finds the proposed Managed Services offering feasible and that similar solutions are either live or in the deployment stages in other markets in the United States. Similar solutions that have been deployed are those that may be found in the state of Vermont, state of Hawaii, and the city of Durham, North Carolina.[1] Other mission-critical industries such as the financial industry have moved to cloud-hosted service models with great success. The State of Arizona should find comfort in understanding that it is not exploring uncharted territory with the proposed cloud-services model.

4. PROGRAM MANAGEMENT

The following section addresses program management level issues associated with the proposed Managed Services. The solution eases the Program and PSAPs' management of the services, as there is a single vendor responsible for all services. This should result in improved coordination in the delivery of services, troubleshooting problems and rolling out new feature functionality. In general, single vendor models provide for a single responsible party, which leads to less finger-pointing and a more productive working relationship. The following table outlines recommendations for enhancing service agreement documentation, improving the terms of the SLAs, and consolidating the documentation into a single Services Agreement.

[1] City of Durham - http://www.9-1-1magazine.com/PPT-Durham-NG911-System?TopicID=521
State of Hawaii - http://globenewswire.com/news-release/2012/10/17/497850/10008819/en/Hawaiian-Telcom-Chooses-Intrado-for-Next-Generation-9-1-1-Services-Delivery.html
State of Vermont - http://www.networkworld.com/news/2011/090711-911-vermont-250601.html

Table 4 – Program Management Review

Topic Area	Commentary	Reference
Single Point of Contact Solution		
Single Point of Contact	Meets requirements. The referenced document provides confirmation that the proposed Managed Services solution is provided with CenturyLink as the single point of contact for the delivery of services. CenturyLink will provide a program manager for daily business needs and a NOC contact for 24 hours a day, 7 days a week (24x7) support.	A9-1-1 Great Migration Plan for AZ, page 13
The agreement ensures the use of the latest technologies, versions and industry standards for CenturyLink Provided Equipment – General		
Product Lifecycle Management	Does not meet requirements. As a service-based solution, system component refresh is required to be provided to ensure that the services purchased are delivered as specified in the contract. To achieve this, it is required that the services have definitive SLAs defining the contractual performance of the solution. These SLAs will drive the provider's Product Lifecycle Management for the solution's software, hardware, firmware, network and maintenance of the solution, to ensure that they are able to deliver to the agreed upon level of service. **MCP recommends** that the Program require SLAs that define the timing for refreshing the components of the solution, as related to software, hardware, firmware, and network performance. **MCP recommends** that software SLAs address feature functionality and the timing for providing software updates to the system once they become available. For example, software updates will be applied to all call handling systems within a pre-determined amount of time from their general availability. **MCP recommends** that hardware SLAs address the refresh cycle for maintaining hardware components such that the solution is never at risk due to software system requirements, manufacturer discontinued products, and failing hardware.	Not Applicable

Topic Area	Commentary	Reference
	MCP recommends that firmware SLAs require the provider to complete manufacturer recommended firmware updates within a pre-defined timeframe and after lab-based regression testing has been performed with new firmware. **MCP recommends** that network SLAs require a predefined set of network performance metrics, such as network availability measured in minutes of downtime per year; jitter threshold; average roundtrip delay; MOS; and packet loss. **MCP recommends** that maintenance SLAs require a predefined level of response to service-affecting outages. The SLAs would focus on response times and mean time to repair. **MCP recommends** that an i3 Guarantee SLA address when the solution will be updated to meet future i3 versions. For example, the Managed Services offering shall be current with i3 standards, with no more than 12 months passing after the ratification of each i3 version. **MCP recommends** that all SLAs have significant remedies to incent the provider to maintain the system at the agreed upon levels of service. **MCP recommends** that SLA metric reports be provided monthly and be independently verifiable through system reports, where available. **MCP recommends** that the Program seeks read-only access to the monitoring and reporting systems.	
The agreement ensures the use of the latest technologies, versions and industry standards for CenturyLink Provided Equipment – Software		
i3 Guarantee and software evergreen	Unable to determine whether the solution meets requirements. The referenced documentation clearly states that the Managed Services offering is guaranteed to provide for all functions and protocols specified in NENA i3; however, it does not address how the Managed Services will continually be updated to the most current i3 specifications. Additionally, the CenturyLink documentation does not address software updates to the VIPER, VESTA and GIS applications. Traditional call handling solutions provide for options to purchase “software evergreen,” where the latest software versions	A9-1-1 Great Migration Plan for AZ, pages 1, 2 and 4

Topic Area	Commentary	Reference
	will be made available for subscribers to this offering. **MCP recommends** that the Program request that CenturyLink provide contractual language as to how the core i3 functions, call handling systems and GIS applications will be maintained with the latest software versions available, based on then current industry standards, including but not limited to NENA i3 and its associated supporting industry standards. This documentation should address both the Intrado VIPER and Cassidian VESTA systems.	
The agreement ensures the use of the latest technologies, versions and industry standards for CenturyLink Provided Equipment – Hardware		
End-of-Life equipment	Unable to determine whether the solution meets requirements. The referenced diagram shows "AS5350" labeling of a gateway icon at the Phoenix and Tucson LNGs (far left boxes) with ingress to the box via multiple DS1s and direct connectivity into (Cisco) 3945 routers. This design leaves MCP with the understanding that the LNG gateways are Cisco AS5350 Universal Gateways. In our research, we found that these gateways were put on End-of-Life notice in 2006, with the last date of support being December 21, 2011. This leaves us to believe that these could possibly be Cisco AS5350XM Universal Gateways, which are also under End-of-Life notice, but with a last date of support being February 28, 2018; however, Cisco is no longer providing software maintenance support as of February 2014. This research elicits several areas of concern: 1. What is the actual device providing the gateway function at the LNGs? 2. If the device is under an End-of-Life notice, then does the device have a current service contract? How long until the service contract expires? 3. What is the process for introducing new hardware, software and firmware to the solution design? 4. What is the migration plan to replace these devices prior to the expiration of the service contract? 5. What other devices not labeled in the diagram are also under an End-of-Life notice? If applicable, what do their service contracts and replacement schedules look like?	NG911 Managed Services - Arizona Network Diagram

Topic Area	Commentary	Reference
	The issues above pose a threat to the viability of the solution unless there are migration plans established within the product support expiration dates. As such, **MCP recommends** that the Program request that CenturyLink address the questions above. These concerns highlight the need for requiring hardware SLAs as described in the above Product Lifecycle Management topic to ensure there are significant repercussions for lapses in hardware support.	
The agreement ensures the use of the latest technologies, versions and industry standards for CenturyLink Provided Equipment – Firmware		
Firmware SLAs	Unable to determine whether the solution meets requirements. The following commentary is outlined above in the Product Lifecycle Management topic. As a service-based solution, system component refresh is required to be provided to ensure that the services purchased are delivered as specified in the contract. To achieve this, it is required that the services have definitive SLAs defining the contractual performance of the solution. These SLAs will drive the provider's Product Lifecycle Management for the solution's software, hardware, firmware, network and maintenance of the solution, in order to ensure that they are able to deliver to the agreed upon level of service. Specifically, **MCP recommends** that the Program require SLAs defining the timing for refreshing the components of the solution as related to software, hardware, firmware, and network performance. **MCP recommends** that firmware SLAs require the provider to complete manufacturer recommended firmware updates within a pre-defined timeframe and after lab-based regression testing has been performed with new firmware.	Not Applicable
The agreement ensures the use of the latest technologies, versions and industry standards for CenturyLink Provided Equipment – Network		
Network Design	Meets requirements. The proposed network design incorporates industry leading standards by incorporating multiple levels of redundancy and diversity throughout the design. Highlights of the network design include: • Geographic diversity of LNGs	AZ NG9-1-1 Technical Review 4-14-14, Sections 6.2, 13.5.2, 13.6.2, 13.7.5

Topic Area	Commentary	Reference

	• Geographic diversity of POPs
	• Geographic diversity of host data centers
	• Redundant system components
	• Redundant edge routers
	• Redundant VPNs for each application
	• Diverse VPN demarcation for each application
	• IP Bandwidth allocations for 100 percent redundancy with 100 percent capacity
	• Use of industry leading network protocols:
	  o MPLS
	  o Signaling System 7 (SS7) – Best solution for TDM environments
	  o Virtual Router Redundancy Protocol (VRRP)
	  o Hot Standby Router Protocol (HSRP)
	  o Layer 2 SLA
	  o Layer 3 Border Gateway Protocol (BGP)
	  o Quality of Service (QoS)
	
	Concerns have been addressed in other sections that include primary/secondary configurations, meshed connectivity between systems, and redundant Layer 2 connectivity between the VESTA hosts. Additionally, **MCP recommends** that the Program require CenturyLink to incorporate encryption via protocols such as Generic Routing Encapsulation (GRE) over IP Security (IPSec) tunnels.	

The agreement ensures the use of the latest technologies, versions and industry standards for CenturyLink Provided Equipment – Maintenance		
Maintenance for Managed Services	Unable to determine whether the solution meets requirements. As this is a service-based solution, the PSAPs and Program are not responsible for maintaining any of the hardware and software for the Managed Services offering. This provides a great benefit to the Program and its PSAPs, as it eliminates unexpected capital expenditures when equipment failures arise and when software upgrades require new hardware. However, the maintenance documentation provided by CenturyLink lacks detail	MCP Responses Set 1 sed, Answer 2, Section 1.4.3 “Technical support and related services for incidents or service disruptions that CenturyLink determines relate to systems, equipment or network issues that are not part of the Next Gen 9-1-1

Topic Area	Commentary	Reference
	pertaining to response times, coordination of troubleshooting with solution partners, feet-on-the-street support, repair times, and tiered incident management support. The referenced statement presents a concern regarding a potential disconnect between the maintenance documentation provided by CenturyLink on May 20, 2014, and the Managed Services offering, as there is no demarcation point in ownership of the equipment and services, i.e., CenturyLink is responsible for all equipment related to the delivery of the 9-1-1 call from the point it reaches the ESInet all the way to the workstation headset jack. Therefore, it is believed that the demarcation reference is not applicable. **MCP recommends** that the Program require additional detail from CenturyLink of the aforementioned details that are lacking in their response and provide this in the consolidated Services Agreement. The language should align with services being provided.	Routing network **(including those on the PSAP side of the demarcation point**), or are otherwise not CenturyLink's responsibility hereunder, will be worked jointly with the **PSAP and/or PSAP.**" Bold formatting applied by MCP to highlight the statements referenced.
Service Agreement Updates		
Aggregate all documentation into a single Service Agreement	Does not meet requirements. As mentioned previously in this report, **MCP recommends** that the Program require that CenturyLink incorporate all of the commitments, service descriptions, processes and service offering documentation into a single, consolidated CenturyLink Services Agreement. MCP envisions that the consolidated Services Agreement would incorporate all of the MCP recommendations that the Program feels are applicable and appropriate. This consolidated agreement would be a single resource to the Program as it would incorporate all of the Managed Services and their service descriptions, with the assurances that its contents are backed by the potential contracted provider of the services, CenturyLink. This is especially important as several of the documents provided by CenturyLink are on its manufacturers "paper", e.g., The Great Migration Plan is an Intrado Proposal and the PowerProbe document is their own marketing brochure. In some cases, it would be appropriate for CenturyLink to refer to appendices for things such as MPLS network SLAs, but a vast majority of the document should be contained within its body.	

Topic Area	Commentary	Reference
	MCP recommends that the consolidated Master Services Agreement contain service guides or detailed service descriptions for the routing service, the i3 solution (LNG, ESRP, PRF, ECRF, LVF, CIDB, LIS, Spatial Information Function [SIF]), ALI management services, MapSAG®, VIPER® CPE systems and applications (MIS, MapFlex 9-1-1®, Power 911®), VESTA® CPE systems and applications (Aurora®, Vela®, UI, ORION™ DataSync etc.), TXT29-1-1®, A9-1-1® Address Intelligence, A9-1-1® Media), the ClearView℠ reporting solution, PAD, PowerProbe®, and the software/hardware refresh program. The Services Agreement should document SLAs as recommended in the above **Product Lifecycle Management** topic and be customized to the Program's needs. The end goal of this recommendation is that all services are well documented with SLAs in a single source on the service provider's contract documents.	
Out-of-Scope Requests	Unable to determine whether the solution meets requirements. The referenced Section 16 was not included in the CenturyLink documentation. **MCP recommends** that the Program obtain this information from CenturyLink and have it incorporated into the consolidated Services Agreement.	AZ NG9-1-1 Technical Review 4-14-14, Section 3.1 "The following ALI to ALI steering scenarios are not covered by this Service Exhibit (see Section 16, Out-of-Scope requests)"
Plant/CML References Updated to Cassidian	Does not meet requirements. **MCP recommends** updating Plant/CML to Cassidian to reflect the accurate company name.	AZ NG9-1-1 Technical Review 4-14-14, Section 5.0 • "Delivery over the iQ MPLS private port directly to the PSAP's CPE. The CPE must be capable of accepting emergency voice calls over IP and has been validated to be compatible with CenturyLink's Request for Assistance Interface (RFAI) or Plant/CML specifications.

Topic Area	Commentary	Reference
		• As PSAPs migrate from CAMA deployments to RFAI or Plant/CML, the connectivity model will change. As part of an RFAI or Plant/CML deployment the PSAP's connectivity will go through additional network management and security devices (such as Session Border Controllers and Firewalls). This connectivity model change will not cause a change in the cost to CenturyLink and/or the PSAP."
QoS	Unable to determine whether the solution meets requirements. **MCP recommends** that the Program require that CenturyLink update this language to state that QoS will be implemented across the ESInet. NENA i3 requires that IP traffic within an ESInet must implement DiffServ (RFC2475) for QoS.	AZ NG9-1-1 Technical Review 4-14-14, Section 6.2 • "The CenturyLink-provided iQ MPLS private port will support QoS IP prioritization to allow the management of the prioritization of 9-1-1 voice/data/OAM network traffic"
IP Address Scheme	Does not meet requirements. **MCP recommends** that the sentence be updated to include POPs, VIPER host sites, and VESTA host sites.	AZ NG9-1-1 Technical Review 4-14-14, Section 6.3 "CenturyLink will manage the IP address scheme for Next Gen 9-1-1 Routing communications through the CenturyLink iQ MPLS private port for connectivity to ECMC sites, LNG sites and PSAPs."
Next Gen 9-1-1 Routing	Unable to determine whether the solution meets requirements.	AZ NG9-1-1 Technical Review 4-14-14, Section 7.1

Topic Area	Commentary	Reference
	MCP recommends that the Program seek clarification from CenturyLink as to the meaning of the referenced section. Specifically, what does "specialized management" entail?	"Next Gen 9-1-1 Routing allows for specialized management of wireline, wireless, and VoIP call types."
	Unable to determine whether the solution meets requirements. **MCP recommends** that the Program seek clarification from CenturyLink as to the meaning of the referenced section. Specifically, what are CenturyLink-established preferences and needs? How would those apply to the PSAPs' flexible routing instruction rules? Is the word "instruction" needed?	AZ NG9-1-1 Technical Review 4-14-14, Section 7.1 "Next Gen 9-1-1 Routing will support flexible routing instruction rules, depending on CenturyLink-established preferences and needs."
Shared 3-Digit Bridge Lists	Unable to determine whether the solution meets requirements. MCP interprets the referenced section as being a future feature. **MCP recommends** that the Program confirm this understanding for itself. **MCP recommends** that the Program request a committed timeline for the delivery of this feature.	AZ NG9-1-1 Technical Review 4-14-14, Section 7.2 "**Shared 3-Digit Bridge Lists**: The ability for the call taker to use a single button on the call taker's display and transfer unit to complete either a transfer or three-way conference. These transfers utilize pre-provisioned Star Codes (*200-*999). These Star Codes will be shared among numerous PSAPs (i.e., all PSAPs in a particular State could use the same Star Codes). In order to match the functionality that CenturyLink has deployed within its region, CenturyLink will develop this capability as part of the Product Roadmap."
Call Setup Time	Does not meet requirements. **MCP recommends** that these types of commitments be backed by a SLA that has significant remedies.	AZ NG9-1-1 Technical Review 4-14-14, Section 8.2 "Within an 8 or 10 digit CAMA deployment, the Call Setup Time

Topic Area	Commentary	Reference
		duration shall not exceed 5 seconds from the time the call is received by CenturyLink LNG. Within an IP deployment (RFAI), the Call Setup Time duration shall not exceed 3 seconds."
Alarm Monitoring	Unable to determine whether the solution meets requirements. **MCP recommends** that "timely communications" be defined in terms that are appropriate for the PSAPs.	AZ NG9-1-1 Technical Review 4-14-14, Section 8.3 "CenturyLink will provide timely communications to PSAP customer regarding any facility or service conditions that will affect the operations of Services." "CenturyLink will provide timely communications to PSAP customer and STATE regarding any facility or service conditions that will affect the operations of the E9-1-1 system."
Alarm Monitoring	Unable to determine whether the solution meets requirements. **MCP recommends** that CenturyLink define how testing support will be provided. For example, 24x7 or 8 a.m. – 5 p.m. Monday through Friday?	AZ NG9-1-1 Technical Review 4-14-14, Section 8.3 "CenturyLink will provide testing support when required to evaluate CPE connectivity problems."
I to I process	Unable to determine whether the solution meets requirements. The referenced section contains terminology that is unfamiliar to common industry knowledge. **MCP recommends** that the Program request clarification from CenturyLink on the "I to I process."	AZ NG9-1-1 Technical Review 4-14-14, Section 9.9 "Requests for additional or customized reports, query capabilities, and graphical data display should be made in accordance with the I to I process."
IP Selective Router Functional	Does not meet requirements.	AZ NG9-1-1 Technical Review 4-14-

Topic Area	Commentary	Reference
Components	The components listed in this section are not IPSR components. **MCP recommends** that this title be updated to "i3 Functional Elements."	14, Section 12.1 Title "**IP Selective Router Functional Components"**
Emergency Call Routing Function (ECRF) and Location Validation Function (LVF)	Does not meet requirements. Arizona PSAPs will migrate independently to i3 depending on their individual readiness. **MCP recommends** that this sentence be updated to "PSAPs" instead of "State of Arizona."	AZ NG9-1-1 Technical Review 4-14-14, Section 12.1.1 "As the State of Arizona transitions from a Tabular MSAG and ESN based routing to GIS based routing, the required ECRF and LVF elements will be available."
Border Control Function (BCF)	Does not meet requirements. Border Control Functions require firewalls for data traffic and session border controllers (SBC) for voice traffic. Both data and voice traffic are part of the Managed Service. **MCP recommends** that "or" be struck from the referenced sentence.	AZ NG9-1-1 Technical Review 4-14-14, Section 12.1.2 "The CenturyLink solution will include Border Control Function with Firewalls (FW) and / or Session Border Controllers (SBC)."
GIS Routing	Does not meet requirements. PSAPs must be able to migrate to geospatial routing independent of one another. **MCP recommends** updating the sentence to the following: "The CenturyLink solution provides all required NENA i3 functional elements to support a GIS-based routing architecture as PSAPs are ready to move to this routing architecture."	AZ NG9-1-1 Technical Review 4-14-14, Section 12.1.4 "The CenturyLink solution provides all required NENA components to support a GIS based routing architecture when the STATE is ready to move to this routing architecture."
LNGs	Does not meet requirements. **MCP recommends** that the Program require a statement from CenturyLink be added to this section that commits to placing LNGs in two data centers within Arizona. This commitment protects the State in the case that one or both of the	AZ NG9-1-1 Technical Review 4-14-14, Section 13.1

Topic Area	Commentary	Reference
	two tentative data centers become unavailable. This would commit CenturyLink to use data center(s) in the state, in order to eliminate the possibility of the solution backhauling TDM traffic to another state.	
ESRP	Does not meet requirements. **MCP recommends** that the second sub-bullet be updated from "ESRT/PRF" to "ESRP/PRF."	AZ NG9-1-1 Technical Review 4-14-14, Section 14.3 • "Functional representation of proposed solution showing core components of the ECMC including: o LVF o ESRT/PRF o ECRF o BCF"
PSAP Equipment	Unable to determine whether the solution meets requirements. **MCP recommends** that the document be updated to clarify how many monitors will be provided and of what size/type, e.g., cathode-ray tube (CRT), flat-panel, 22-inch, touch screen, etc.	AZ NG9-1-1 Technical Review 4-14-14, Section 15.5
Headset Integration	Unable to determine whether the solution meets requirements. There is no mention of whether headset integration services will be provided with the Managed Services. **MCP recommends** that the Program request that CenturyLink clarify whether headset integration service is included with the installation of PSAP equipment and end-to-end testing.	Not Applicable
Training Size	Unable to determine whether the solution meets requirements. **MCP recommends** that the class size limit be specified as "number of attendees."	AZ NG9-1-1 Technical Review 4-14-14, Section 16.2 "CenturyLink will provide (1) Agent Train the Trainer class to each new PSAP. Train-The-Trainer classes will cover all agent topics as well as tips to train the call takers specific to the

Topic Area	Commentary	Reference
		PSAP. Class size is limited."
Ad Hoc Training	Unable to determine whether the solution meets requirements. **MCP recommends** that the Program ask CenturyLink for clarification of whether the referenced ad-hoc training is at an additional fee or is included in the Managed Services. If there is an additional fee, then what is the fee? Also, the sentence should be updated so that the word "bases" is changed to "basis."	AZ NG9-1-1 Technical Review 4-14-14, Section 16.7 "CenturyLink will provide onsite technician support on ad-hoc bases to demonstrate features for call taker supervisors. This is not in lieu of formal training."
Service Level Goals	Does not meet requirements. The industry norm is 99.999 percent availability. **MCP recommends** that the Program require that CenturyLink revise the Management Availability Performance Goal to be 99.999%.	Managed 911 - Service Level Goals - 6-11-2013, Section 1.2 "9-1-1 Routing and ALI Management Availability Performance Goal is 99.998%."
	Does not meet requirements. **MCP recommends** that the Program require that CenturyLink revise the Notification Goal of the Level 1 and Level 2 SLAs to be within 30 minutes per FCC Report and Order 13-158, and include periodic updates until the system is restored. **MCP recommends** that the Program require that CenturyLink perform, and provide a report on, a root-cause analysis of all outages no more than 90 days after the restoration of service.	Managed 911 - Service Level Goals - 6-11-2013, Section 1.2 https://www.fcc.gov/document/fcc-adopts-rules-improve-911-reliability Appendix B, Part 4 The rules from FCC 13-158 were released on December 13, 2013 and require that 911 Service Providers who provide "NG911 capabilities such as call routing, automatic location information (ALI), automatic number identification (ANI), or the functional equivalent of those capabilities, directly to a public safety answering point (PSAP),"…"shall notify as soon as possible but no later than thirty minutes after discovering the outage

Topic Area	Commentary	Reference
		any official who has been designated by the affected 911 special facility as the provider's contact person(s) for communications outages at that facility and convey all available information that may be useful in mitigating the effects of the outage, as well as a name, telephone number, and e-mail address at which the service provider can be reached for follow-up. The Covered 911 Service Provider shall communicate additional material information to the affected 911 special facility as it becomes available, but no later than two hours after the initial contact."
	Does not meet requirements. **MCP recommends** that the Program request that CenturyLink delete the rolling 2/4/8 months clause from the remedy statement. As written, the rolling 2/4/8 month clause reduces the potential for CenturyLink to have to provide remedy for its service issues, which dilutes the sense of urgency and level of importance of the service to the vendor.	Managed 911 - Service Level Goals - 6-11-2013, Section 1.2 "…mean time to repair is not met for a given rolling two months." "…mean time to repair is not met for a given rolling four months. "…mean time to repair is not met over a rolling 8 month period."
	Does not meet requirements. **MCP recommends** that the example for Level 1 should be amended as follows (emphasis added to indicate the updates to the existing language):	Managed 911 - Service Level Goals - 6-11-2013, Section 1.2, Level 1 Example "PSAP not receiving calls, audio is

Topic Area	Commentary	Reference
	"PSAP not receiving calls, audio is **not** working **even if only on** intermittent calls, End office traffic is not able to reach PSAP, **not** returning ALI bids, network hardware or circuit failure to data complex."	working only intermittent calls, End office traffic is not able to reach PSAP, returning ALI bids, network hardware or circuit failure to data complex."
	Does not meet requirements. **MCP recommends** that the example for Level 2 should be amended as follows (emphasis added to indicate the update to the existing language): "… system response time problems; single sided ALI function; **single sided routing function**."	Managed 911 - Service Level Goals - 6-11-2013, Section 1.2, Level 2 Example "…system response time problems; single sided ALI function."
	Does not meet requirements. **MCP recommends** that the Notification Goal for Level 3 should be amended as follows (emphasis added to indicate the update to the existing language): "as soon as possible **within** 1 day of the identification of the service disruption."	Managed 911 - Service Level Goals - 6-11-2013, Section 1.2, Level 3 Notification "as soon as possible 1 day of the identification of the service disruption."
	Does not meet requirements. **MCP recommends** that the Program require CenturyLink to provide a SLA for call delivery time.	AZ NG9-1-1 Technical Review 4-14-14, Section 5.2 "Within an IP deployment (RFAI), the Call Setup Time duration shall not exceed 3 seconds."
	Does not meet requirements. **MCP recommends** that the Program require CenturyLink to provide SLAs as revised above for other mission-critical services provided in this Managed Services offering, including but not necessarily limited to text to 9-1-1, i3 routing functions, and the Hosted Call Handling solution, and not just NG9-1-1 routing and ALI.	Managed 911 - Service Level Goals - 6-11-2013
Support (Network and PSAP)		
Network and PSAP	Unable to determine whether the solution meets requirements.	MCP Responses Set 1 sed, Answer 2

Topic Area	Commentary	Reference
	The Managed Services offering provides 24x7 monitoring and maintenance of the solution, with the NOC providing support to PSAPs around the clock. This level of support is commonplace within the industry. As part of the recommended consolidated Services Agreement effort, **MCP recommends** that the Program require CenturyLink to rewrite the referenced section's content to address all of the Managed Services and not just the MPLS network and/or the NG9-1-1 routing solution, as it is currently written. See the **Maintenance for Managed Services** topic above for additional details and concerns regarding support documentation.	
Review of metrics and data provided by the ClearView Reporting Tool		
ClearView Metrics	Does not meet requirements. The ClearView metrics provide PSAPs with insight to call processing within the IPSR. This represents a tremendous amount of information that the PSAPs do not have today for their LSRs. The data appear pertinent to PSAP operations and would seem to be helpful when troubleshooting issues, verifying the sufficiency of call taking capacity for shifts, and researching call transfer trends. The ClearView metrics only address IPSR statistics and appear to have a gap for reporting on i3 call routing functions, data validation, text messaging, and other services included in the offering. NENA is currently working on a standard titled "NENA Next Generation 9-1-1 Data Management Standard," which will define i3 discrepancy and performance reports. MCP has staff contributing to this standard and we anticipate that it will be finalized and published later this year. **MCP recommends** that the Program ask CenturyLink for clarification regarding whether the Managed Services offering provides reporting on i3 call processing and data validation processes. **MCP recommends** that the Program request that CenturyLink advise as to the time zone that will be reflected in the ClearView data and how this will correlate to the unique time zone management within the State of Arizona. Additionally, **MCP recommends** that the Program ask CenturyLink whether the ClearView reporting tool gives users the ability to	Clearview reports - A911

Topic Area	Commentary	Reference
	perform ad hoc reports and build their own metrics based on available data. If appropriate, **MCP recommends** that the Program request that CenturyLink grant access to these reports so that the Program may view state-level reports for all PSAPs using the Managed Services.	
Review of overall metrics as being necessary and sufficient to support the State's objective.		
Overall Metrics	Does not meet requirements. The Managed Services offering documentation contained only ClearView IPSR metrics. Based on several recommendations throughout the report, MCP believes that there are additional data and metrics that would be of value to the Program and Arizona PSAPs. Many of the SLAs that have been proposed should be accompanied by metrics reports proving compliance/non-compliance with each SLA. **MCP recommends** that the Program consider the following metrics, and for those that the Program feels may be of value, require CenturyLink to provide applicable monthly metrics. • Network Performance Metrics o Jitter – average o MOS – low, high, average o Round trip delay – average o Packet loss – average o Downtime – seconds per month per system o Call delivery time – number of calls above 3 seconds, percent of total processed • Operational Metrics o Trouble tickets opened/closed o Trouble tickets – average duration • Call Processing and System Provisioning Metrics o See **ClearView Metrics** topic area above	Clearview reports - A911

5. CONCLUSION

The Managed Services offering from CenturyLink presents the State of Arizona with an opportunity to upgrade its aging 9-1-1 architecture with standards-based NG9-1-1 technology that will serve its PSAPs and citizens needs now and well into the future. The solution enables PSAPs to move from an unpredictable and difficult–to-fund capital expense model to a predictable operating expense model, which is of critical importance to the State in times of limited 9-1-1 funding. The solution is viable and the technical solution design meets industry standards in terms of redundancy, diversity, and survivability. New features such as geospatial routing would foster new operational capabilities by enabling PSAPs to distribute calls more efficiently. Additionally, the solution would enable users to send requests for help via text messages, which is a service that will greatly benefit the deaf and hard-of-hearing community, as well those who may be unable to make a voice call due to service coverage issues or when making such a call will endanger them. While these end results of the deployed solution will provide great benefit to all stakeholders involved, MCP recommends additional due diligence to ensure that the Program has a clear and detailed understanding of the Managed Services model, with proper documentation of the proposed services.

CENTURYLINK NG9-1-1 with Managed 9-1-1 CPE Technical Service Exhibit for State of Arizona 9-1-1 System

August 15, 2014

SECTION	TITLE
1	NEXT GEN 9-1-1 ROUTING SERVICES OVERVIEW
2	INCREMENTAL ALI MANAGEMENT SERVICES
3	*PS/ALI*
4	NEXT GEN 9-1-1 Routing Infrastructure
5	CENTURYLINK NEXT GEN 9-1-1 Network Design
6	System Backups & Redundancy
7	NEXT GEN 9-1-1 Routing Services
8	Monitoring, Maintaining, and Technical Support
9	Tools
10	ESInet Design
11	Migration Process
12	NEXT GEN 9-1-1 IP Network Design
13	CPE Managed Services
14	Local GIS Data Management
15	IP Recording of 9-1-1 Calls
16	Customer Training
17	CENTURYLINK Support
18	Document References
19	“AZ NG9-1-1” Drawing Reference

Definition of Terms

Term	Definitions
ALI	Automatic Location Identification
BGP	Border Gateway Protocol
CAD	Computer Aided Dispatch
CAMA	Centralized Automatic Message Accounting
CDR	Call Detail Record
CE	(Customer Edge) MPLS Router at customer site. CENTURYLINK will provide this equipment with the Managed 9-1-1 Solution
CPE	Customer Provided Equipment
CUG	Closed User Group
DDOS	Distributed Denial of Service Attack
Diversity	Two paths with no single point of failure with two complete entrance facilities
DOS	Disk Operating System
ECMC	Emergency Call Management Center. Location of IP Selective Router, i3 functional elements, and VIPER Hosts
ECRF	Emergency Call Routing Function
ELT	English Language Translations
EM Trunk	Emergency Management Trunk
EO	End Office
ES Trunk	Emergency Services Trunk
ESInet	The network the i3 architecture runs on
ESN	Emergency Services Number
ESQK	Emergency Service Query Key
ESRD	Emergency Services Routing Digit
ESRK	Emergency Service Routing Key
ESSID	Electronic Switching System Identification
FW	Frequency Modulation
Gateway	Gateways are used to convert legacy TDM (Time Division Multiplexing) voice calls to IP
GIS	Geographic Information Systems
GPS	Global Positioning System
GUI	Graphical User Interface
HSRP	Hot Standby Router Protocol
ILEC	Independent Local Exchange Carrier
IP	Internet Protocol
IPP	IP Precedence
IPSR	IP Selective Router
IQ MPLS	IQ MPLS Private Port - CENTURYLINK Product name for a private MPLS network.
KVM	Keyboard, Video, and Mouse
LATA	Local Access and Transport Area
LNG	Legacy Network Gateway - Interfaces between the legacy network and the ESInet
LSR	Legacy Selective Router
LSRG	Legacy Selective Router Gateway
LVF	Location Validation Function
MOA	Memorandum of Agreement
NGAP	Next Gen Aggregation Point
NPD	Numbering Plan Digit (1 digit number assigned to represent an area code. Example: 2 = 602, 3 = 520)
OAM	Operations, Administration and Management
PE	(Provider Edge) CENTURYLINK network equipment used to provision its IP Network
PGM	PSAP Gateway Manager
POP	Point of Presence - an artificial demarcation point where servers, routers, and other devices are located

PSAP	Public Safety Answering Point
QoS	Quality of Service
RCL	Regional Co Location - Now referred to as LNG
RFAI	Request for Assistance Interface
RTT	Real Trip Time
SBC	Session Border Control
SIP	(Session Initiated Protocol) – The protocol used for initiating, managing, and terminating VoIP traffic over an IP network
SLA	Service Level Agreement
SR	Selective Routing
SRDB	Selective Routing Database
SS7	Signaling System 7
TDM	Time Division Multiplexing
TG	Trunk Group
TN	Telephone Number
TSP	Telecommunication Service Provider - TSP means a provider of wireline, wireless, VoIP, MLTS (shared tenant or PBX providers) or any other service provider permitting its End Users of such technology to access a PSAP by dialing the digits 9-1-1 and having the applicable 9-1-1 Governing Authority's approval to access said PSAP(s). TSP for the purpose of this Agreement includes, but is not limited to, all ILECs, CLECs, CMRS, VoIP or other service providing entities requiring access to Intrado Comm's Intelligent Emergency Network®.
TSS Database	Transaction Services System – A data management system developed by Intrado that processes and maintains data for ALI retrieval and selective routing for enhanced 9-1-1 systems.
VoIP	Voice over IP
VPN	Virtual Private Network - a logical private network running over 1 physical connection.
VRRP	Virtual Router Redundancy Protocol

1.0 NEXT GEN 9-1-1 ROUTING SERVICES OVERVIEW

CENTURYLINK's Next Gen 9-1-1 Routing is a specialized managed network for processing 9-1-1 calls from both traditional voice and non-traditional voice and data networks. Next Gen 9-1-1 Routing provides traditional selective routing functionality and IP-enabled interface alternatives. Next Gen 9-1-1 Routing is a service for the routing and delivery of 9-1-1 calls from end office, central office, control office, mobile switching center, and IP-enabled interface alternatives (hereafter collectively referred to as "End Office") to STATE designated PSAPs over a CENTURYLINK IQ MPLS Private Port, rather than routing such calls through the ILEC's selective router. Next Gen 9-1-1 Routing includes the delivery of ANI and supports 8 (NPD+7) or 10 digits. Next Gen 9-1-1 Routing service requires the input of selective routing database (SRDB) updates from the database management system. Other SRDB data sources are anticipated in the future. As such, all TNs/ESRKs/ESRDs/ESQKs as well as all such pseudo ANI schemas which may be propagated via the NENA recommended standards or any national standards body, routed with the Next Gen 9-1-1 Routing solution must be available to CENTURYLINK database management services as set forth in this Service Exhibit.

Next Gen 9-1-1 Routing allows for specific call routing rules to be defined by CENTURYLINK. These include, but are not limited to:

- Selective Routing
- Trunk Only Routing
- PSAP Abandonment Routing
- Alternate Routing
- Default Routing
- Any other optional routing functionality that may become available through Next Gen 9-1-1 Routing services

PSAPs will work with CENTURYLINK to define and manage the PSAP's routing rules during the data gathering stage of the implementation. If PSAP or CENTURYLINK determines that changes need to be made, CENTURYLINK will make these changes without disruption of service.

2.0 INCREMENTAL ALI MANAGEMENT SERVICES

IPSR Routing service requires the input of SRDB updates from the TSS database management system. As such, all TNs/ESRKs/ESRDs/ESQKs that are to be routed with the Next Gen 9-1-1 Routing solution must be managed through the TSS database management services.

2.1 ALI TO ALI STEERING FOR WIRELINE 9-1-1 CALLS

As part of Next Gen 9-1-1 Routing services, CENTURYLINK will initiate communications with non-CENTURYLINK ALI providers for ALI to ALI steering via CENTURYLINK provided IP connectivity. ALI to ALI steering will be performed for wireline 9-1-1 calls only.

CENTURYLINK acknowledges that ALI to ALI steering covered by this Service Exhibit will only address the steering scenarios defined in Section 2.1.

CENTURYLINK acknowledges that coordination will be required between CENTURYLINK and other 9-1-1 service providers in the assignment and on-going management of English Language Translations ("ELTs") (ESN/ESSIDs). Without this coordination, the ELTs may not work properly. CENTURYLINK cannot guarantee the cooperation of other 9-1-1 service providers.

In the event that there are multiple 9-1-1 service providers in the area, CENTURYLINK will initiate efforts to work with these service providers to identify the appropriate method of obtaining the ALI data.
The following ALI to ALI steering scenarios are not covered by this Service Exhibit (see Section 2.2, Out-of-Scope requests):

- The non-CENTURYLINK ALI system does not support ALI to ALI steering.
- The non-CENTURYLINK ALI system ALI to ALI interface does not meet the CENTURYLINK interface specification.
- The selective router (SR) owner differs from the ALI owner.

- The PSAP is served by multiple SRs, but trunk number sent in each wireline ALI Query does not correspond to the SR.
- The PSAP receives transferred calls from multiple Non-CENTURYLINK PSAPs served by different non-CENTURYLINK ALI systems, but multi-steering rules cannot be configured to distinguish which non-CENTURYLINK ALI to query.

2.2 Out-of-Scope Requests

PSAP requests that are beyond the scope of the deliverables outlined in this Service Exhibit will require an enhancement request to CENTURYLINK. CENTURYLINK will reply using the Document of Understanding ("DOU") form outlining PSAP's request and CENTURYLINK's proposed solution. CENTURYLINK will respond in writing, as needed.

2.3 Enhancements for NEXT GEN 9-1-1 Data PSAPs

CENTURYLINK will complete and maintain Next Gen 9-1-1 Data and ALI-M enhancements to support ALI to ALI steering for PSAPs using Next Gen 9-1-1 Data

3.0 PS/ALI

The PS/ALI product will allow Private Switch or Centrex End Users within the CENTURYLINK region to manage Private Switch Subscriber information specifically allowing the Private Switch or Centrex End Users to create and update Private Switch Subscriber records with detailed station-level location information. The Private Switch detailed, station-level Subscriber information will be available to the PSAP during a 9-1-1 call to allow emergency responders to know the location of the calling party from a Private Switch system in a large or multi-building facility. These services are governed by this Service Exhibit. Charges for these services will be handled in the following ways:

- Existing CENTURYLINK PS/ALI customers that are converted to a 9-1-1 routing that require CAMA trunks to be moved to the Intrado LNG will be converted at no charge and monthly port fees will be waived
- New CENTURYLINK PS/ALI customers will require the appropriate network security measures in place, at no cost to Intrado.
- New CENTURYLINK PS/ALI customers that require CAMA trunks to be terminated on the Intrado LNG will be charged PS/ALI fees as stated in the tariff.

4.0 NEXT GEN 9-1-1 Routing Infrastructure

The Next Gen 9-1-1 Routing infrastructure is comprised of redundant, regionally diverse facilities that process an inbound emergency call and successfully presents the emergency call to the PSAP. The current infrastructure design is as follows: call enters the CENTURYLINK Next Gen 9-1-1 Routing network from the End Office (EO) through at least a pair of Legacy Network Gateways (LNGs) and, utilizing a set of pre-determined routing rules, is presented over a private iQ MPLS private port to the PSAP. Next Gen 9-1-1 Routing has the ability to deliver the emergency calls to the PSAP as 8 or 10 digit ANI using one of two methods, depending on the capabilities of the PSAP's Customer Premise Equipment. These methods are:

- Receipt of EO traffic over SS7, CAMA, PRI and/or IP
- Receipt and delivery of Selective Router Traffic (Call transfers and call handoffs) over SS7.
- Delivery over the private iQ MPLS private port and at the PSAP site, converting the signaling back into CAMA through the provided PSAP Gateway Managers (PGMs), using standards specified in NENA 04-001.
- Delivery over the iQ MPLS private port directly to the PSAP's CPE. The CPE must be capable of accepting emergency voice calls over IP and has been validated to be compatible with CENTURYLINK's Request for Assistance Interface (RFAI), Intrado's ESRP Terminating Interface for A9-1-1 or Cassidian specifications.
- As PSAPs migrate from CAMA deployments to SIP, the connectivity model will change. As part of SIP deployment, the PSAP's connectivity will go through additional network management and security devices (such as Session Border Controllers and Firewalls). This connectivity model change will not cause a change in the cost to CENTURYLINK and/or the PSAP.
- ISDN PRI to the PSAP is not currently supported.

5.0 CENTURYLINK NEXT GEN 9-1-1 NETWORK DESIGN

Following the execution of the Agreement, CENTURYLINK and PSAP will finalize the detailed design of the Next Generation 9-1-1 call routing network delivering emergency calls to the PSAP.

CENTURYLINK will authenticate all other third-party service provider's data applications through CENTURYLINK infrastructure. Furthermore, the Parties will incorporate into this Service Exhibit a mutually agreed upon Statement of Work defining (i) CENTURYLINK's suite of Next Gen 9-1-1 Service data applications, and (ii) the Parties' roles, responsibilities and obligations regarding said applications. The Statement of Work will contain interface specifications associated with authentication. CENTURYLINK will provide to PSAP a brief description of each third-party application, a brief description of the application authentication and a notification of acceptance. If any third-party service provider's application fails to authenticate, CENTURYLINK will provide a copy of the outline sent to the third-party provider detailing the portion of the authentication that failed and any corrective actions that need to be taken in order to authenticate.

All private ports between CENTURYLINK ECMC and the PSAP will be assigned to a dedicated Closed User Group (CUG) and follow the authenticate process as mutually agreed upon.

No application will be activated without the PSAPs direct authorization. The authentication process will include an assessment and identification of the bandwidth impact.

5.1 IP TO HOST

CENTURYLINK will provide diverse IP connectivity through diverse POPs via the CENTURYLINK provided iQ MPLS private port from the ECMC to the PSAP (VIPER or VESTA) Host.

5.2 PUBLIC SAFETY IQ MPLS PRIVATE PORT REQUIREMENTS

CENTURYLINK will provide IP connectivity between Next Gen 9-1-1 Routing ECMCs and the PSAP site. All equipment to be deployed at the PSAP to support Next Gen 9-1-1 services will be supplied by CENTURYLINK.
The CENTURYLINK provided IP connectivity from the Next Gen 9-1-1 Routing solution to the PSAP will meet the following requirements:

- Redundant and diverse IQ MPLS private port connectivity to the PSAP, where facilities allow.
- A maximum 150 millisecond Round Trip Time (RTT) through network, assuming 500 bytes sustained for 1 minute without packet loss.
- The iQ MPLS private port will have the appropriate levels of security in place both at the physical and application layers to provide for 99.999% availability.
- The CENTURYLINK-provided iQ MPLS private port will support QoS IP prioritization to allow the management of the prioritization of 9-1-1 voice/data/OAM network traffic
- The CENTURYLINK provided iQ MPLS private port will meet the industry standard P.01 grade of service. P.01 will be applied from CENTURYLINK sites to the PSAP over the CENTURYLINK supplied network.
- Card level mapping will be provided when orders for circuits are placed. CenturyLink will disclose where any single points of failure may exist due to network convergence.

5.3 NETWORK PROTOCOLS

The ESInet design is based on current open industry standards and NENA i3. Network components are based on Cisco IOS software. The Cisco IOS software DiffServ is fully compliant with the Internet Engineering Task Force (IETF) standards defined in RFC 2474, RFC 2475, RFC 2597 and RFC 2598.

Quality of Service

The primary network between the data center and PSAPs will implement Quality of Service (QoS) to manage and prioritize any type of IP traffic (voice, data, and multi-media). QoS is performed primarily through packet marking with Differentiated Services Code Point (DSCP) for scalable management of network traffic. The audio stream (Real Time Transport Protocol - RTP) is marked with "Expedited

Forwarding," the highest class of service available. This is appropriate for real-time media like voice, and is mapped to a priority queue. Signaling packets (Session Initiation Protocol or Media Gateway Control Protocol) are placed in another queue. This prioritization of packets ensures that voice packets get the highest priority in the network.

Encryption

RTP is not specifically encrypted to the user; however; transport between devices over IP access clouds is encrypted using standard IPSEC (AE256) tunneling.

Mean Opinion Score

Edge routers in the ESInet perform constant quality testing back to the core data centers by sending a stream of synthetic RTP packets across the tunnels that traverse the IP network via Cisco's IPSLA (Internet Protocol Service Level Agreement) functionality. The IPSLA configuration is managed by the PSAP edge routers towards the routers at the data centers. The core routers then change the sequence number and timestamp on each synthetic RTP packet, which is then retransmitted back to the remote site router.

This generates a four-second stream of RTP towards the mGRE interface on the data center edge router, using the same G.711 codec used for the voice application itself. One hundred packets are sent with an interval of 40 milliseconds. The test restarts after five seconds (each test is padded with an extra second to avoid overlapping tests). The Cisco IPSLA application then derives both Impairment Calculated Planning Impairment Factor (ICPIF) and MOS (Mean Opinion Score) values from these detailed test results.

If the MOS score drops to 4.00 or below, a Cisco Embedded Event Manager (EEM) script will failover the call over to the alternate IP network instance with no impact to the quality of the call. The EEM will continue to monitor the "failed" path and will require 16 consecutive four-second tests scoring above a MOS of 4.0 in order to begin using the previous MPLS path. With this configuration, the system will consistently achieve greater than 4.0 MOS.

The Center of Excellence network operations center (NOC) will actively monitor the network's quality using the industry standard MOS that automatically activates alarms on the router if the MOS score dips below a specific value. When this occurs, the router will automatically route all traffic over the redundant IP network route.

Included Protocols and Technology:

- Border Gateway Protocol (BGP)
- Cisco Express Forwarding Multilayer Switching (CEF-MLS)
- Cisco Internet Protocol Service Level Agreement (IPSLA)
- Connectivity Fault Management (CFM)
- File Transfer Protocol (FTP)
- Hypertext Transfer Protocol Secure (HTTPS)
- Internet Protocol Security (IPSEC)
- IEEE 802.1Q (Dot1Q)
- Link Aggregation Control Protocol (LACP)
- Media Gateway Control Protocol (MGCP)
- Multipoint Generic Routing Encapsulation (mGRE)
- Multiprotocol Label Switching (MPLS)
- Microsoft Message Queuing (MSMQ)
- Open Shortest Path First (OSPF)
- Real Time Transport Protocol (RTP)
- Rapid Spanning Tree Protocol (RSTP)
- Session Initiation Protocol (SIP)
- Simple Network Management Protocol (SNMP)
- Secure Shell (SSH)
- Transmission Control Protocol / Internet Protocol (TCP/IP)
- Virtual Router Redundancy Protocol (VRRP)
- Virtual Local Area Network (VLAN)

- Virtual Routing and Forwarding (VRF

5.4 IP Address Schema

CENTURYLINK will manage the IP address scheme for Next Gen 9-1-1 Routing communications through the CENTURYLINK iQ MPLS private port for connectivity to ECMC sites, LNG sites, VIPER and VESTA Hosts, and PSAPs, including CENTURYLINK POPs.

5.5 Standard Security Procedures

The CENTURYLINK provided iQ MPLS private port will have the appropriate levels of security in place both at the physical and application layers, as determined within IPP. CENTURYLINK will secure the CENTURYLINK-provided iQ MPLS private port using industry standard security procedures against security attacks from other networks or the public Internet. The CENTURYLINK-provided iQ MPLS private port will be a virtual private network, with IP addresses not publicly accessible via the public Internet. CENTURYLINK will work with PSAP customer as needed to ensure router configurations meet PSAP customer security requirements, provided such requirements do not conflict with CENTURYLINK internal security procedures.
CENTURYLINK will employ security measures where a PSAP may have dual-homed CPE (connected to both the CENTURYLINK solution and another service provider's network)

5.6 Intrado Data Centers and NG9-1-1 Security

Intrados' cyber security policies, standards, and guidelines are compliant with industry best practices as defined by International Organization for Standardization and Control Objectives for Information and related Technology (COBIT). Intrados' expertise and commitment to network security are evidenced by our active participation in the Network Reliability and Interoperability Council (NRIC) 7 focus group 2B Cyber-Security. Intrados' next generation emergency services network is a secured and private IP managed network. All inbound and outbound traffic is through well defined and controlled access points. Call processing and real-time data delivery are implemented through specialized subnets.

Intrado employs a defense-in-depth security strategy to protect sensitive information. Such controls include, but are not limited to stateful packet inspection firewalls (host and network based), IDS/IPS, ACLs, Role-based Access control, two-factor authentication, encryption, and AV (email and host). Furthermore, systems are protected with build standards, patch management, and regular vulnerability scans.

Sensitive data is housed in our data centers with logical and physical access controls. Development environments are separate from production and production data is not used in dev or SQA.
Data that transits untrusted networks (leaves Intrado custody) through applications or communication channels with encryption to safeguard confidentiality and integrity.

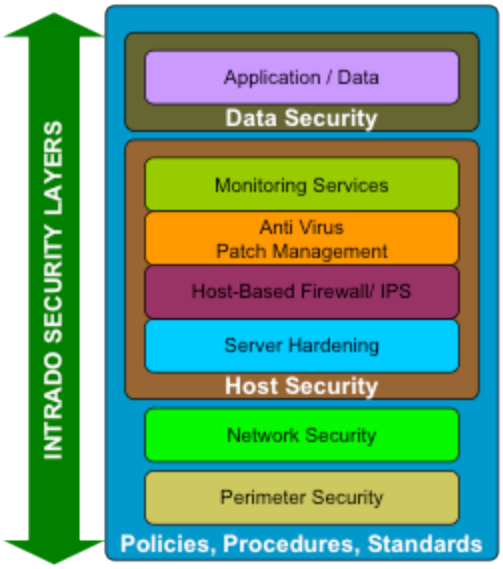
Finally, Intrado employs an Incident Handling process modeled on FEMA's Incident Command System. Notifications are built into this process.

Intrado infrastructure is built to withstand sophisticated attacks (including DDOS) by means of a defense in depth strategy. Intrado employs high availability systems with redundancy at geographical, carrier, circuit, power, application, and system levels. System/Application availability is safeguarded with clustering and load balancing techniques. Furthermore, Intrados' security architecture employs defenses that include, but are not limited to, Stateful packet inspection firewalls, IDS/IPS, multi-factor authentication, strong encryption, anti-virus/anti-malware, and vulnerability/patch management solutions. All inter-zone traffic is restricted to only the necessary protocols/destinations, both ingress and egress.

The Intrado infrastructure is built to withstand sophisticated attacks, including Distributed Denial of Service (DDOS) attacks, by means of a defense in depth strategy. Defense in Depth is designed to defend a system against any particular attack using several, varying methods. It is a layering tactic,

conceived by the National Security Agency (NSA) as a comprehensive approach to information and electronic security. Defense in depth is the coordinated use of multiple security countermeasures to protect the Confidentiality, Integrity & Availability of the information assets in an enterprise. The strategy is based on the military principle that it is more difficult for an enemy to defeat a complex and multi-layered defense system than to penetrate a single barrier. Defense in depth minimizes the probability that the efforts of malicious hackers, Viruses and Malware will succeed. A well-designed strategy of this kind will help the Intrado security personnel, network engineers, and system administrators, identify entities that attempt to compromise the Intrados' computers, servers, and networks. If a malicious attempt is launched against one of the Intrados' resources, defense in depth will minimize the adverse impact and give Intrado personnel time to deploy new or updated countermeasures to prevent recurrence.

The placement of protection mechanisms, procedures and policies is intended to increase the dependability of the Intrado systems where multiple layers of defense prevent direct attacks against the Intrado systems. Components of defense in depth are identified below and include firewalls, intrusion prevention and detection, data / network segmentation. Any combination of these measures can and should be deployed in accordance with the business continuity determination, risk assessment, and customer requirements for a given product opportunity.



Defense in Depth Strategy

The Intrado ESInet solution provides for all of the necessary appliances and security services including firewalls, routers, switches, intrusion detection services, and cabling for securing the NG9-1-1 applications and appliances located at the data centers.

5.7 CENTURYLINK DATA CENTERS AND NG9-1-1 SECURITY

Please see attached CENTURYLINK Data Center Brochures.
Additional Notes:

- All entry points are locked continuously or on an access control system
- All employees, guests, and contractors are required to use a single entry point
- All employees, guests, and contractors are required to badge in and out
- Data Centers are manned 7/24
- A visitor to a Savvis facility, who is not an authorized Customer, Employee, and Contractor will be considered a Visitor and must demonstrate a legitimate business purpose for visiting the site. The Visitor must be escorted by an authorized Savvis escort at all times. Authorized escorts are Savvis employees or customers who have been issued a permanent ID badge and are in good standing with Savvis and are permitted to escort up to five visitors at one time. Groups of six or

more visitors must be processed as a Data Center Tour. Contractors and third-party vendors are not permitted to sponsor Visitors.
- Visitors are required to show ID with photograph before entering data centers
- Background criminal checks are performed on all employees with access to the data centers

5.8 APPROPRIATE LEVELS OF SECURITY

Intrado

Intrado Internet accessible systems, including the subscriber record management data exchange portal, database management interface tool, and metrics tool, are protected by a secure access process that requires authentication through a unique user name, unique user password, and a code randomly generated at time of access via a secure ID token. The use of this secure ID restricts users to accessing and viewing only their own data, protecting confidentiality. Passwords are force changed and monitored on regular intervals.

Intrado network is capable of processing all traffic, but administratively denies protocols identified as a threat or that otherwise fall outside of pre-defined parameters. This is partially managed via routing tables and/or Access Control Lists (ACLs). Intrado continually investigates and upgrades with new advances in protective technology with tools such as Intrusion Detection System (IDS).
The solution incorporates physical, network, and application security principals. Traffic between core processing sites and distributed sites (e.g., ingress call traffic, PSAPs, management capabilities) is route and protocol secure. A combination of route paths, IP address recognition, limited protocols, VPNs, session border controllers, and firewalls secure the various communication elements of the solution.

Intrado deploys firewalls and other network security devices and software to protect against inbound network threats on the servers that make up the ESInet. Intrado also employs a regularly scheduled patching process to protect against the effects of malware. Computing devices are subjected to thorough security scans so that there are no malware elements present. Access to processing elements is restricted to authorized personnel. Network connections from solution components are limited to those connections needed for operation and maintenance. Physical and network access to production components are restricted to those that have an operational responsibility and all activity is audited and monitored.

All development environments are fully separate from production environments. All hardware and software elements that are deployed in a production environment go through stringent release management processes that incorporate thorough testing and scans.

It should be noted that during the requirements analysis and design phases of the project, the State, 9-1-1 entities, and the Intrado project teams investigate any connections to networks outside the scope of this Services Exhibit, for example connections to other public safety agencies or connections to the Internet, so that all safeguards, including firewalls, are in place.

Intrado facilities and nodes are equipped with physically redundant data communications and power equipment such that any component can be maintained without overall service impact. Buildings and supporting facilities such as generators, fuel, and entrance demarcations require card access and are monitored 24 hours a day by security personnel. Additionally, biometric readers and card access portals are deployed in areas containing critical infrastructure components.

Intrado is a member of the Government Emergency Telecommunications Service (GETS) that is used in the event our core communications cannot be used. Intrado personnel sit on the board of the telecommunication industry and government's National Coordination Counsel, which is the coordinating group for cyber threats and terrorism. This allows us to stay abreast of national and international threats that may affect the Next Gen 9-1-1 infrastructure and mitigate changes as necessary.

Intrado's Information Security department operates an enterprise-wide vulnerability management program to verify that all hosts and network devices meet rigid standards of configuration and hardening. This

program ensures not only deployment verification, but also ongoing oversight of system level protections throughout the lifecycle of the system.

Vulnerability management at an enterprise level provides visibility to systems added and removed from any area of Intrado's network infrastructure, allowing an always-on view to changes which may impact the security posture of the organization.
Intrusion prevention systems complement other network related protections in place, and are another layer of information assurance. These systems are continuously monitored by networking professionals, and provide real-time intelligence regarding traffic flows and the internal or external elements involved in transmission.

Intelligence reports both from internal sources, as well as from external entities including US-CERT, the Internet Storm Center, the Homeland Security Advisory System and other open-source vulnerability research assets are reviewed for vulnerabilities, anomalies, or indications of non-optimum activity, and Information Security Officers interface with all levels of the organization, including IT, management, business units and customers to effect resolution of issues related to network, application and systems security. Information Security Officers and management review numerous open and classified sources of information on a weekly basis in order to respond as necessary to a world socio-political climate which requires constant vigilance with regard to Intrado's commercial and public safety business.

Information Security Officers also have a Communications Security (ComSec) Custodial function, being the source of expertise and policy and technical direction regarding the use of cryptography for all electronic communications to achieve the organization's confidentiality, non-repudiation and integrity objectives. Key escrow and other capabilities are managed by Information Security Officers.

Information Security operates corporate perimeter protection capabilities, including firewalls of various types. Officers provide direction as required by senior management to engineering and other areas of the company regarding perimeter protection. Technical security policy is recommended by Information Security Officers to management, ad hoc as well as in scheduled policy reviews.

Information Security Officers also serve an advisory capacity to all levels of management regarding threats and their mitigation with regard to the company's information assets. Officers are expected to advise and maintain the highest standards of operational security. Operational security practices, as forwarded by the Information Security Department, are a vital component of the organization's security posture. These include but are not limited to employee training, recommendations regarding physical security, auditing and employee relations.

CENTURYLINK Technicians and Engineers
CENTURYLINK hiring process includes background checks on all of our employees (including 9-1-1 technicians). CENTURYLINK also provides background checks on our registered sub-contractors and product partners. Our comprehensive background checks include all of the important searches.

In addition to the CENTURYLINK background checks, our 9-1-1 centers complete fingerprinting and additional background checks on all CENTURYLINK employees and subcontractors.

6.0 System Backups & Redundancy

6.1 Intrado

A9-1-1 Systems are backed up with Symantec NetBackup on hardware that is sized to support the entire enterprise. Documentation for the backup processes are maintained at Intrado facilities and may be viewed in an audit process. Audit activities taking place within Intrado facilities would require prior vetting of any personnel to enter the facility. Collateral may be reviewed but must remain within the Intrado facility.

Network configuration management tools perform the following functions:

- Detect and report on configuration policy violations to ensure compliance with corporate standards.
- Utilize configuration templates and command templates, custom scripts, and configuration changes to ensure consistent implementation of network configurations across similar site types
- Simultaneously modify configurations, change community strings, update ACLs, and block MAC addresses across many devices
- Compare start-up and running configuration files to troubleshoot device configurations issues
- Automatically check all network elements for changes and perform backup for all changed network device configurations on a daily basis
- Intrado network configuration tools provide version control and "rollback" functionality to all network elements. This allows the restoral of previous "known good" configurations, or timely restoral of stored configurations in the event of equipment failure or disaster recovery.

Intrado's provisioning, monitoring, and backup systems are redundant between Longmont, Englewood, and Miami. Intrado's NOC staff is located in Longmont and can be relocated to either of the other centers if there is a need.

6.2 CASSIDIAN

Cassidian Communications' Disaster Recovery is highly effective in minimizing call taker position and server downtime. Through perfect snapshots of the monitored system, a system can be quickly restored to any saved working state while preserving current data files.

- **Snapshot Backups.** Disaster Recovery "snapshot" software consists of a client and server component; client software would be installed on all clients/servers within the scope of the specific contract between Cassidian Communications and Customer addressing this issue. Clients are backed up to the appropriate Network Management Server location.
- **Disaster Recovery.** If a system fails, using the normal notification processes, Cassidian Communications will roll the system back to a known good sate. This is conducted in concert with first tier maintenance for the respective site. All data will be stored on-site and local NAS devices.

Disaster Recovery

This service provides scheduled backups of all Cassidian Communications provided servers and workstations to the Network Management Server (NMS). The NMS will manage the Call Center site backups.

If a system fails (virus infection or corrupted install, etc.) the following process will be remotely implemented by Managed Services in conjunction with on-site personnel.

- With assistance from the CENTURYLINK Tech, Managed Services will create a startup disk on the NMS for the specific workstation or server that requires recovery.
- The CENTURYLINK Tech will boot the computer with the startup disk and notify Managed Services that the system is up and that the recovery process can begin.
- Managed Services implements the recovery process and notifies the CENTURYLINK Tech once completed.
- The CENTURYLINK Tech tests the workstation/server – with assistance from Managed Services – and confirms the computer recovered and available for use by the site.
- Managed Services provides a device recovery confirmation e-mail to the Telco.

Reporting

Cassidian Communications Disaster Recovery system maintains data to provide monthly reports as illustrated below. The goal of the report is to provide the PSAP insight as to the frequency of full and incremental backups performed during the previous month.

The goal of the Backup Recovery report is to provide the PSAP insight as to the number of backups being performed on a monthly basis. The number of backups will be consistent on a month to month basis, except if a problem occurs where a restore is required or a deployment of a new version of application software is performed.

Disaster Recovery	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	YTD

Management Activity							
Total Backups	**39**	**65**	**52**	**52**	**44**	**60**	**312**
Total Recoveries	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Backup/Recovery Report Example

- **Total Backups** – This section identifies the number of backups performed during the previous months
- **Total Recoveries**- This section identifies the number of restores of a backup performed during the previous months

7.0 NEXT GEN 9-1-1 ROUTING SERVICES

7.1 ROUTING RULES

Next Gen 9-1-1 Routing processes all inbound emergency calls and successfully presents the emergency calls to the PSAP in accordance with the routing rules determined with CENTURYLINK and provisioned during the implementation stage. Next Gen 9-1-1 Routing allows for specialized management of wireline, wireless, and VoIP call types so that different call types may have the ability to have separate routing policies for originating delivery, transfer, fail over, choking, etc. For example, SMS is routed differently based on a PSAPs selection of delivery method (i3, browser, TTY). Call types are determined based on the incoming call source facility (e.g. MSC, End office), as well as the information provided within call signaling.

Next Gen 9-1-1 Routing will support flexible routing instruction rules, depending on CENTURYLINK-established preferences and needs. To this end, CENTURYLINK will provision the following based upon CENTURYLINK's requirements for the PSAP:

- Each incoming End Office connection (IP or TDM) is identified for the appropriate routing treatment. The current routing treatments are identified below:
  - **Selective Routing:** Routing rules are based upon the calling party ANI. Routing is determined based upon the ANI match to an ESN (Emergency Services Number) and an Electronic Switching System Identification ("ESSID").
  - **Trunk Only Routing:** The incoming End Office trunk is assigned an ESN/ESSID which relates to a specific ingress trunk group. Trunk Only Routing is available for TDM traffic only. A comparable method is employed for ingress IP connections.
  - **PSAP Abandonment Routing:** Specific routing instructions to be applied in the event that the PSAP must evacuate its facility. This can include routing the calls to busy.
  - **Alternate Routing**: Specific routing instructions to be applied as alternate location for routing in the event that all lines to the primary PSAP are busy, or the primary PSAP is closed for a period of time. Multiple, prioritized alternate route destinations are supported. This can include routing the calls to busy.
  - **Default Routing:** Specific default routing instructions to be applied for each incoming trunk group. 9-1-1 calls are routed to the default PSAP in the event of an ANI failure, unintelligible digits received from end office (ES) or control office (EM), or other rare causes. In the event of ANI Failures, a Default ESN will be assigned based on the Ingress Trunk/Path.
  - **Destinations and Route Lists: The solution** is able to specify a unique route list for each routing rule. These route lists allow for designation of a primary target with numerous prioritized alternate destinations such as:
    - PSAP served by Next Gen 9-1-1 Routing
    - PSAP served by a non- CENTURYLINK selective routing service
    - PSTN number
    - Busy
    - Treatment message
    - Tone
  - **PSAP Trunk Group Management:** Each incoming trunk is individually designated to carry a particular call type and/or combination of call types. The solution provides the ability to manage call type designations thereby changing the mix of call types

CENTURYLINK will work with PSAPs to define and manage the PSAP routing rules during the data gathering stage of the implementation. If PSAP or CENTURYLINK determines that changes need to be made, CENTURYLINK will make these changes without disruption of service.

7.2 TRANSFER AND BRIDGING

Next Gen 9-1-1 Routing will support the following flexible transfer/bridge capabilities following NENA 03-003 Tandem to Tandem Transfer. (These transfers only occur via SS7). Specific connectivity specifications for SR to SR connectivity are spelled out within ***Foreign Selective Router Interface Specification.***

- **Selective Transfer/Bridge:** The ability for the call taker to transfer an incoming 9-1-1 call to another agency by pressing a button labeled with the type of agency; e.g., "Fire," on the PSAP premises equipment. These transfers utilize pre-provisioned Star Codes (*01-*06) on a per-PSAP basis. In order to match the functionality that CENTURYLINK has deployed within its region, CENTURYLINK will need to expand the number of Selective Bridge Star Codes to **01-**06/*11-*16.
- **Fixed Transfer/Bridge:** The ability for the call taker to use a single button on the call taker's display and transfer unit to complete either a transfer or three-way conference. These transfers utilize pre-provisioned Star Codes (*20-*49) on a per-PSAP basis. In order to match the functionality that CENTURYLINK has deployed within its region, CENTURYLINK will need to expand the number of Fixed Bridge Star Codes to *99.
- **Manual Transfer/Bridge:** The ability for the call taker to complete a manual transfer, by way of 10-digit dialing and delivery via PSTN.
- **Shared 3-Digit Bridge Lists**: The ability for the call taker to use a single button on the call taker's display and transfer unit to complete either a transfer or three-way conference. These transfers utilize pre-provisioned Star Codes (*200-*999). These Star Codes will be shared among numerous PSAPs (i.e., all PSAPs in a particular State could use the same Star Codes). In order to match the functionality that CENTURYLINK has deployed within its region, CENTURYLINK will develop this capability as part of the Product Roadmap which is currently planned for late 2015 delivery and is subject to change.

7.3 VOICE AND DATA TRANSFER

The Parties recognize that the individual TSPs will be responsible for installing and maintaining connectivity from all supporting TSP End Offices/MSCs to the CENTURYLINK LNG POPs.

CENTURYLINK and the TSP will be responsible for working together to jointly install and maintain connectivity between the CENTURYLINK SRs and alternative service providers serving PSAP and at least two CENTURYLINK LNG POPs to support voice transfers of PSAP to/from PSAPs residing on the CENTURYLINK SR(s).

CENTURYLINK will work with each non-CENTURYLINK ALI host provider to establish communications with each non-CENTURYLINK ALI host provider via the CENTURYLINK provided IP connectivity.

7.4 TRANSFERS BETWEEN CENTURYLINK LSR AND ALTERNATE PROVIDERS LSR

The standard offering includes ALI only transfers with wireless or VoIP calls and not wire-line calls. Given that the State uses CENTURYLINK ALI databases today, processes could be put in place to use State ALI nodes in place of/to supplement the National ALI nodes so that wire-line ALI could be transferred.

This would be additional effort and associated cost beyond the scope of the current offering.

The proposed transition configuration steps include installing a Legacy Selective Router Gateway (LSRG) between the ESInet and the legacy Tandem routers. This makes possible the following services:

- Allows PSAPs on the ESInet to receive 9-1-1 calls from the Legacy Selective routers until the TSP's have migrated their circuits over to the ESInet.
- Allows call transfer with additional information, such as ALI, and depending on CPE, case notes and TTY, between PSAPs still on the legacy tandems and PSAP on the ESInet.

- Allows call transfer with additional information, such as ALI, and depending on CPE, case notes and TTY, between PSAPs on the ESInet and PSAPs on the legacy tandems.

Intrado assumes connectivity to legacy PSAPs will continue to be provided from the legacy selective routers during the migration phase. The migration strategy includes establishing legacy tandem connectivity to the ESInet at the LSRGs. Legacy PSAPs will continue to receive their 9-1-1 traffic from the legacy selective routers until the PSAPs upgrade to become A9-1-1 Routing (RFAI) or i3-based PSAPs. Optionally, PSAPs could connect to the ESInet and continue to function as legacy PSAPs using Legacy PSAP Gateways (LPG). This enables legacy PSAPs A9-1-1 Routing (RFAI) and i3-based PSAPs to be homed on the ESInet and they will be able to interoperate by transferring 9-1-1 calls with ANI and ALI. Legacy PSAPs will receive 9-1-1 voice via their existing CAMA trunks and continue to bid ALI until their migration is completed.
Use of the LSRG may eliminate the requirement for Legacy PSAP Gateways (LPGs), since PSAPs migrated to the ESInet can still communicate to PSAPs not yet migrated. Intrado realizes there may be specific cases during the migration process where LPGs may be required and will be provided. If required, specifications of the LPG are provided below:

LPG

Calls routed via the ESInet and delivered to a legacy PSAP will undergo signaling interworking to convert the incoming Session Initiation Protocol (SIP) signaling to the traditional Multi-Frequency (MF) or Enhanced Multi-Frequency (E-MF) signaling supported by the legacy PSAP. The LPGs will allow legacy PSAPs to receive calls and retrieve Automatic Location Identification (ALI) data the same way they do today.
The LPG will also support an ALI interface over which it can receive and respond to ALI queries from legacy PSAPs. Interfaces to a Location Information Server (LIS) and a Legacy Network Gateway (LNG) will also be supported by the LPG so that it can perform a de-referencing operation if the SIP signaling from the ESInet includes a location-by-reference. In addition, the LPG will support an Emergency Call Routing Function (ECRF) interface to facilitate certain emergency call transfer scenarios, as well as interfaces to the Call Information Databases (CIDBs) to provide access to additional non-location data associated with the emergency call, if a reference to such data is provided in incoming SIP signaling.

i3 PSAP LSR Transfer Limitations

Transfers to or from Legacy Selective Routers are voice transfers only. There is no mechanism for transferring the PIDF-LO or the Emergency Incident Data Document (EIDD) to exchange location data and any other supplemental data or alternatively URIs to the dereferencing systems that would provide the data or data updates to the PSAP. Legacy PSAPs with CAMA connectivity must bid the legacy ALI systems to retrieve location information as they do today regardless of whether they are connected to the ESInet.

7.5 Implementing and Maintaining Configurable PSAP Attributes

At a minimum, the following data elements will be configured by CENTURYLINK for PSAP. While initial provisioning will occur during the migration preparation period, the CENTURYLINK or PSAP authorized personnel may request modifications to the provisioning to meet its changing needs:

- PSAP Trunks:
  - NPD assignment (if appropriate)
  - Trunk assignments by call type (wireline, wireless or VoIP)
  - Add or delete trunk members
- Route Lists/Routing Rules:
  - Primary and alternate routes
  - Selective transfer list/star code destinations for first responders, Police Department, Fire, and Emergency Medical Services
  - Fixed bridge lists such as poison control or neighboring PSAPs
  - PSAP abandonment routing rules

CENTURYLINK will work with each TSP to gather and confirm information to support data provisioning for trunks incoming from the End Office to the Next Gen 9-1-1 Routing network including the following data:

- Incoming signal type
- Call type
- Implied numbering plan administration ("NPA"), if applicable

7.6 NEXT GEN 9-1-1 SELECTIVE ROUTING DATABASE UPDATES

Intrado's TSS Database Management system, operated under contract to CENTURYLINK as a 9-1-1 Service Provider, will provide Next Gen 9-1-1 Routing SRDB updates to the SRDB in the following manner: SRDB updates will be created by CENTURYLINK's TSS Database system for all records that have successfully passed data validation. SRDB updates will be delivered to the Next Gen 9-1-1Routing system by the next calendar day following successful data validation.

8.0 MONITORING, MAINTAINING, AND TECHNICAL SUPPORT

CENTURYLINK will be responsible for ongoing support and maintenance of the Next Gen 9-1-1 Routing network design and implementation. This includes the monitoring and maintenance of call processing so to reduce and limit effects of call congestion.

CENTURYLINK will be responsible for ongoing support and maintenance of the Next Gen 9-1-1 Routing network hardware and for the provision of necessary upgrades to support the operations of Next Gen 9-1-1 Routing as defined in this Service Exhibit. This responsibility does not include enhancements, features or functionality beyond the scope of this Service Exhibit.

CENTURYLINK has responsibility for 24x7x365 monitoring, maintenance, and technical support of the CENTURYLINK-provided MPLS network and components as further delineated above. This section describes the monitoring, maintenance, and technical support for the non-CENTURYLINK components of the solution that will be provided by CENTURYLINK.

CENTURYLINK will provide PSAPs with a 24x7 point of contact to report network related issues and will make a commitment to resolve network issues in the shortest amount of time feasible.

8.1 MONITORING

CENTURYLINK will monitor each Next Gen 9-1-1 Routing node on a 24 hour, 7 days per week, 365 days per year basis. CENTURYLINK performs monitoring of all communications links, including between the Next Gen 9-1-1 Routing network and CENTURYLINK's PSAP. CENTURYLINK is responsible for detecting application and network failures on CENTURYLINK's Next Gen 9-1-1 Routing nodes. CENTURYLINK will follow notification procedures as jointly agreed upon between CENTURYLINK and PSAP Customer.

8.1.1 Network Monitoring

The CENTURYLINK data communications hardware used to terminate circuits will be capable of automatically rerouting traffic in the event of a facility failure where redundant connectivity is available. In addition, CENTURYLINK will measure and report on call delivery times within the Next Gen 9-1-1 Routing solution. CENTURYLINK measures Call Delivery Times from the call's entry into CENTURYLINK network to the delivery of the call to the PSAP's Equipment (ANI/ALI Controller). The type of deployment will affect the estimated Call Setup Time.

Within an 8 or 10 digit CAMA deployment, the Call Setup Time duration shall not exceed 5 seconds from the time the call is received by CENTURYLINK LNG.
Within an IP deployment (RFAI), the Call Setup Time duration shall not exceed 3 seconds.
The Call Setup Times for the CENTURYLINK deployments are reported within the Call Setup Time reports.
CENTURYLINK will monitor and analyze the network and equipment as appropriate to meet CENTURYLINK's obligations in this Service Exhibit.

8.1.2 Monitoring PSAP Circuit Alarms

CENTURYLINK will be responsible for monitoring the CENTURYLINK-provided IP connectivity between the PSAP and CENTURYLINK's ALI servers and Next Gen 9-1-1 Routing system. CENTURYLINK will provide timely communications to PSAP customer regarding any facility or service conditions that will affect the operations of Services. CENTURYLINK will provide testing support on a 24 hour, 7 days per week, 365 days per year basis, when required to evaluate PSAP circuit problems.

CENTURYLINK is responsible for testing network connectivity from demarcation point at the PSAP and the Next Gen 9-1-1 Routing Service equipment installed by CENTURYLINK at the PSAP. CENTURYLINK will provide timely communications to PSAP customer and STATE regarding any facility or service conditions that will affect the operations of the Next Gen 9-1-1 system. CENTURYLINK will provide testing support when required to evaluate CPE connectivity problems.

8.1.3 Trouble Tracking / Escalation

Each Party will participate in the tracking of trouble reports and will provide escalation procedures and contacts to the other Party. CENTURYLINK's Program Manager and PSAP's Program Manager point of contact will develop the escalation procedures during the implementation phase.

8.1.4 Interface with Application Support

CENTURYLINK's primary point of contact will be the Program Manager for PSAP and PSAP personnel who need to interact with CENTURYLINK's application support personnel.

8.1.5 PSAP Problem Investigation

CENTURYLINK has primary responsibility to investigate PSAP problems. In the event that the issues are determined to not be Next Gen 9-1-1 related, CENTURYLINK will assist PSAP in solving PSAP problems.

8.2 MAINTENANCE

8.2.1 System Upgrades

CENTURYLINK will notify STATE and PSAP customer at least 10 business days in advance of planned events and be responsible for ongoing support of the Next Gen 9-1-1 Routing network and for the provision of necessary modifications and upgrades to support the operations of the Next Gen 9-1-1 Routing network as described in this Service Exhibit. CENTURYLINK may need to apply changes to its software applications in response to emergency situations and will notify STATE and PSAP customer at the earliest possible time.

8.2.2 Premise Equipment

CENTURYLINK will be responsible for the ongoing support/maintenance for all CENTURYLINK PSAP Network Equipment provided under this Service Exhibit.

8.3 TECHNICAL SUPPORT

8.3.1 Contact Procedures

CENTURYLINK Contact Procedure: For service disruptions CENTURYLINK provides twenty-four (24) hour, seven (7) days per week support services. CENTURYLINK provides a 9-1-1 Operation Center Number for service disruptions and connectivity issues identified by CENTURYLINK, State, or PSAP. CENTURYLINK will record issues reported by State or PSAP including problem description, service impact, and other pertinent information.

PSAP Contact Procedure: Where CENTURYLINK has identified a PSAP affecting service disruption, CENTURYLINK provides initial notification and updates to the identified State and/or PSAP contacts according to the guidelines established and agreed to between CENTURYLINK and PSAP.

8.3.2 CENTURYLINK Responsibilities

CENTURYLINK has primary responsibility to investigate PSAP problems and determine if they are caused by CENTURYLINK or PSAP-owned network or equipment. CENTURYLINK will work cooperatively in resolving problems related to Next Gen 9-1-1 Routing. CENTURYLINK will be responsible for solving any problems caused by CENTURYLINK PSAP Network Equipment in addition to all Next Gen 9-1-1 Routing equipment hosted at CENTURYLINK facilities.

8.3.3 PSAP Caused Service Disruptions and Out of Scope Technical Support

The PSAP may report PSAP-caused service disruptions to CENTURYLINK either verbally or by written notice, or as CENTURYLINK otherwise reasonably requires. Likewise, CENTURYLINK may report PSAP-caused service disruptions detected by CENTURYLINK personnel to the PSAP. Technical support and related services for incidents or service disruptions that CENTURYLINK determines relate to systems, equipment, or network issues that are not part of the Next Gen 9-1-1 Routing network (including those on the PSAP side of the demarcation point), or are otherwise not CENTURYLINK's responsibility hereunder, will be worked jointly with the PSAP and/or PSAP.

8.3.4 Incident Management

When a PSAP-affecting issue is identified, which impacts Next Gen 9-1-1 Routing call delivery to a PSAP, it will be flagged as an incident CENTURYLINK coordinates communication, monitoring, and resolution of the issue. The team also documents appropriate items, which may include root cause analysis, CENTURYLINK/PSAP impacts, countermeasures, and resolution.

Planned Events

Planned events are scheduled for changes that may be CENTURYLINK or PSAP impacting. A notification of the upcoming event will be sent by CENTURYLINK Program Manager to PSAP and/or PSAP at least 10 business days in advance of the scheduled change.
Planned events do not include changes that are applied as part of normal business operations. The provisioning of data elements, applying PSAP requested parameter changes and the like are not included in the Planned Event process.

- CENTURYLINK will perform quarterly preventative maintenance activities at each PSAP for the term of this agreement.
- CENTURYLINK will install all software fixes after they have been "Approved for Field Use" (AFU) as they become available.
- CENTURYLINK will provide (1) system upgrade per year as and if released by Cassidian and/or Intrado and the systems will never be more than one (1) version behind the then current software version.
- CENTURYLINK will maintain critical spares in existing crash kits

9.0 TOOLS

9.1 CLEAR VIEW REPORTS FOR NEXT GEN 9-1-1 ROUTING

CENTURYLINK will provide the Intrado Clear View Reports business intelligence reporting tool for metrics reporting, which will supply users with Next Gen 9-1-1 Routing data and reports. The current Master Agreement ALI metrics will apply to this Service Exhibit.

This suite of reports will be accessible through an Internet interface in a standardized HTML format. Users will be able to view summary data for a "big picture" view, and in many cases, drill down to the detail for a more "granular" view. Users can also download the report as a comma-delimited file, which can be imported into Excel or another database application.

Intrado is in the process of evolving its metrics reporting solution. A9-1-1 Routing customers currently access IP selective router (IPSR) and data validation reports through Intrado's web-based ClearView metrics solution. Enhanced reporting for i3 Routing customers will be delivered through a new Enterprise Business Intelligence (BI) tool, Microstrategy® from Intrado. For the Managed Services offering, Intrado

will provide the Program and PSAP users with access to all metrics reports through a single web-based interface.

User access to metrics reporting tools is through the Intrado portal. The Intrado portal provides users with secure single sign-on access to multiple web-based applications, including metrics reporting, a web-based data management system, the PSAP management portal to view call detail records and configure routing policies, a ticket system, and a document library for 24x7 access to user's guides and training materials.

9.1.1 Call Data Availability

CENTURYLINK provides support services for the reporting systems on a nine-hour 8:00 A.M. to 5:00 P.M. Mountain Time – five (5) days per week (Monday through Friday) basis, excluding CENTURYLINK holidays ("Normal Business Hours").

9.1.2 Call Data Access

CENTURYLINK will store data relating to Customer performance metrics in a data warehouse. One (1) year of data will be available to Customer via the web site; requests for data older than one year will be handled on a case-by-case basis.

9.1.3 ClearView Metrics

Intrado Clear View Reports provides on-demand access to IP selective router (IPSR) and data validation breakout reports which can be queried based on a daily, weekly, or monthly basis. Clear View Reporting gives users the ability to drill down and capture additional contextual information that can be used to more efficiently manage ongoing 9-1-1 operations. ClearView metrics allows users to Print or Export up to one year's worth of Metrics.

9.1.4 ClearView Location Data Management Reports

Clear View Reports for Location Data Management include:

- Primary Metrics Summary Reports
  - Service Order Processing
  - Daily Error By Number of Records Processed
  - Unresolved Errors at End of Month
  - ALI System Availability
- ALI Records Found
- TN Census Report
- ALI Retrieval Report
- ANI Failure Report
- System Performance Reports
- NRF Reports
- SOI Reports
- TSS Error Reports

9.1.5 Clear View Reports for IPSR

Clear View Reports for IPSR call processing and call status include:

- Event Count Reports per Hour– provides metrics for total calls in which Customer's PSAP participated by hour for a day, week or month
- Event Count Report by Trunk Group – provides metrics for total calls in which Customer's PSAP participated and provides metrics for calls attempted, calls transferred out, calls transferred in
- Event Count by Routing Reason and Destination – Indicates counts where Customer's PSAP participated as the Primary versus Alternate, whether the call was answered or busy, for Default versus Selective routed, and for call where the destination was "Not Available" (includes abandoned, rejected, transferred and handed-off calls). Provides metrics for total calls, initial calls, calls transferred out, and calls transferred in for each category.

- Event Count by Type – Indicates counts by call type (wireless, wireline, VoIP) where Customer's PSAP is primary, and provides metrics for total calls, initial calls, calls transferred out, and calls transferred in.
- Event Count by Incoming Trunk – Indicates the number of calls sent to Customer's PSAP by each trunk, and provides metrics for total calls, initial calls, calls transferred out, and calls transferred in for each category.
- Bridge Call Summary – provides metrics for calls bridged in or out by bridge type (fixed, selective, manual). Call detail is available for each bridged call.
- Routing Database Processing – provides a breakout of initial calls where Customer's PSAP was Primary by selectively routed versus default routed with a No Record Found (NRF) breakout
- Call Delivery Time – provides statistics on the time to route and deliver calls where your PSAP is Primary, including the minimum, maximum, median and average times. For the Program, this report will include the number of calls above 3 seconds and a percent of total processed

9.2 MICROSTRATEGY® FROM INTRADO

For Customers with the Intrado A9-1-1 i3 Routing solution, CENTURYLINK and Intrado will provide an i3 compliant logging service as described above. Intrado's i3 logging service will support retrieval of logs and events via the i3-defined web services interface as well as via a web-based interface.

Intrado's Enterprise BI Reporting Tool, Microstrategy® from Intrado, will provide a web-based interface to allow the PSAPs and Program to review and retrieve i3 Logging transactions and events including text conversations and data validation metrics.

Intrado will support reports defined in NENA 08-003 v2 Detailed Functional and Interface Specification for the NENA i3 Solution, 20140326 Draft:

- RetrieveLogEvent
- ListEventsByCallId
- ListEventsByIncidentId
- ListCallsByIncidentId
- ListIncidentsByDateRange
- ListIncidentsByLocation
- ListIncidentsByDateAndLocation
- ListCallsByDateRange
- ListAgenciesByCallId
- ListAgenciesByIncidentId

In addition to i3 defined logs and metrics reports listed above, Microstrategy from Intrado allows users to:

- Define and run ad hoc reports
- Define metrics reports to be run on a scheduled basis
- Provides a flexible interface to query, view and extract 9-1-1 data records

All of the underlying ESInet translation logs are recorded in GMT time. The Microstrategy from Intrado web interface supports time zone conversion for queries and reports with 'Arizona time' as an option.

9.2.1 Call Counts Metrics

Clear View will provide a number of call count breakout reports, which can be queried based on a daily, weekly, or monthly basis.

- Call counts by hour for each trunk group
- Call counts by routing type, where the PSAP queried was the primary destination
- Call counts by routing type, where the PSAP queried was an alternate destination
- Call counts for transfers/bridges where the PSAP queried was the initiator. This query shows transfer/bridge type and destination of the transfer/bridge
- Call counts for transfers/bridges where the PSAP queried was the destination/recipient. This query shows transfer/bridge type and destination of the transfer/bridge

- Call counts by type: wireless, wireline, VoIP
- Call counts for calls which routed to busy; broken down by cause
- Default routed calls by day, week, or month; further broken down by cause. Time and date can also be broken out

9.2.2 Trunk Busy Metrics

Clear View will provide a number of trunk group status reports, listed below which can be queried based on a daily, weekly, or monthly basis and indicate time and duration of each event

- Next Gen 9-1-1 Routing egress (inbound to PSAP) trunk groups busy. Report indicates time and duration of each event
- PSAPs in abandonment state; including time of events and durations. Viewable by day, week, or month
- When Ingress IP and/or IP to the PSAP are introduced, the data captured will not be grouped by trunk group, as the architecture is different. Similar data will be available, but it will not have the same data elements.

9.2.3 Call Detail Metrics

Clear View will provide Call processing and setup information statistics, which can be queried, based on a daily, weekly, or monthly basis and include:

- Call setup times. Clear View provides the minimum, maximum, median, and average call setup times broken out by TG.
- Call duration times. Clear View provides the minimum, maximum, median, and average call duration times
- Bridge/Transfer call setup time. Clear View provides the minimum, maximum, median, and average call bridge/transfer setup calls
- Bridge/Transfer call duration time. Clear View provides the minimum, maximum, median, and average call duration times for bridged/transferred calls
- Calls handed off to a Foreign SR (calls received by Next Gen 9-1-1 Routing but were destined to a foreign SR).

9.2.4 SR Database Results Metrics

Clear View provides a number SR database results reports by PSAP which can be queried based on a daily, weekly, or monthly basis.

- Number of queries made to the SR database
- Number of queries which failed due to “No Record Found” (no entry in the SR database for the ANI/pANI transmitted from the End Office)

9.3 Clear View Report Data Access and Security

Clear View Reports current security features are as follows: Users are required to log onto CENTURYLINK secure Internet server using the traditional user id and password authentication and an additional unique and dynamically changing secure access code from their Secure ID token. Each user of Clear View Reports will be issued a Secure ID token unique to that user that will generate a unique access code for use when logging onto the Clear View Reports web site. The access code dynamically changes with each new log on attempt, providing increased data access security.

9.4 Metric Report Development and Customization

Requests for additional or customized reports, query capabilities, and graphical data display should be made in accordance with the Out-of-Scope Request process described in Section 2.2.

9.5 Performance Metrics

CENTURYLINK and Intrado will provide overall performance metrics for this Managed NG9-1-1 offering. Program and PSAP users will be able to access all metrics reports through a single web-based interface.

In addition to the IP selective router (IPSR), end to end i3 transaction and event, and data validation breakout reports described above, CENTURYLINK and Intrado will also provide the Program and each PSAP with monthly metrics reports on the following:

9.5.1 Service Performance Metrics

Service Performance Metrics – Monthly performance against all service performance parameters.

9.5.2 Call Delivery Time

Call Delivery Time – Breakout report of call delivery time through the Intrado A9-1-1 Routing or i3 Routing systems including the LPG conversion and Policy Route determination. This report will show the number of calls above 3 seconds and a percent of total processed. The metrics report will not include network latency time.

9.5.3 Network Performance Metrics

Network Performance Metrics – Monthly performance of the CENTURYLINK MPLS network covering:

- Jitter – average
- MOS – low, high, average
- Round trip delay – average
- Packet loss – average
- Downtime – seconds per month per system

9.5.4 Operational Metrics

Operational Metrics – Metrics on trouble tickets opened by CENTURYLINK and Intrado or reported by the Customer through the Intrado portal accessed ticket system, specifically

- Trouble tickets – Number of tickets opened and closed each month
- Trouble tickets – Average time between ticket open and ticket close time. It should be noted that the average ticket close time may not be equivalent to the service resolution time in the case where there were delays in the customer providing additional information needed for Intrado to triage and resolve reported system issues.

9.5.5 Call Processing and System Provisioning Metrics

Call Processing and System Provisioning Metrics – Intrado will provide monthly reports on call processing and system provisioning as described in detail above

9.6 GIS DATA MANAGEMENT

9.6.1 MapSAG Overview

MapSAG is a GIS data management application used by city or county GIS professionals, outside of the call taking environment, allowing a customer to create and maintain accurate 9-1-1 GIS data and to synchronize the GIS database and the 9-1-1 database. The result is a “checks and balances” approach of consistency and accuracy across databases used for addressing and 9-1-1. MapSAG is installed locally, at the customer location, and operates through a simple interface within Esri’s ArcGIS Desktop product. Various toolbars are available for accessing the available tools and features. The functionality that resides in the ArcGIS Desktop framework remains available while using MapSAG, including editing, drawing, layouts and/or spatial queries. An example of the integration of MapSAG and ArcGIS Desktop is that users can perform a spatial or attribute query and use the resulting records for analysis by the MapSAG tools.

Using MapSAG, ArcGIS Desktop and a combination of both, new GIS data records (streets, structures, polygons etc) can be input into the GIS in a number of ways, including field GPS, on-screen digitizing, import, and auto-generation. The GIS data is stored in an Esri format. The MapSAG software currently operates in the latest version of ArcGIS for Desktop 10 or 10.1 and will utilize a Personal Geodatabase, File Geodatabase or an Enterprise Geodatabase through ArcGIS Server (ArcSDE).

MapSAG software requires a licensed copy of Esri’s ArcGIS for Desktop, to be provided by the customer.

Other GIS data management tools are available and may be used instead of MapSAG. Any alternative product must support Esri standard geo-databases. While the solution includes MapSAG at no additional cost, if PSAP chooses to use an alternative product, all such cost for purchasing, support, and maintenance will be the responsibility of the PSAP.

9.6.2 ESRI Software Requirements

MapSAG requires Esri's ArcGIS for Desktop.

9.6.3 MapSAG Responsibility Matrix

Task	Responsibility
MapSAG™	
- Data configuration - Initial implementation - Training - Software maintenance & enhancements - Technical support	CENTURYLINK / Intrado
- Esri software purchase and maintenance - Basic knowledge of ArcGIS for Desktop - Hardware purchase and maintenance - GIS data creation and updates - Database schema updates - Implementation of optional software patches and upgrades - IT support	End User

9.6.4 GIS Data Collection

The Intrado experienced 9-1-1 GIS Data Analyst team will provide remote GIS data management assistance to the Customer, including collection of existing GIS data and/or paper maps, GIS data accuracy validation and reporting, and data correction and editing, where applicable. Priority will be placed on gathering GIS layers required to support i3, including Police, Fire, and EMS response boundaries, street centerlines, address points, and other data appropriate to support data maintenance procedures.

The solution also offers Mapping and GIS Data Development Professional Services to assist the Agency with map and 9-1-1 GIS database editing and correction in various areas.

9.6.5 MapSAG Training

CENTURYLINK and Intrado will provide training, at customer facility, for its A9-1-1 GIS Data Management software products. Training and a training schedule will be mutually agreed upon by CENTURYLINK, Intrado and Customer. Training will be "train-the-trainer" format, which will enable Customer to train additional employees.

As new versions of MapSAG are made available through the term of the agreement, CENTURYLINK and Intrado will mutually agree upon an updated training schedule for the Customer. Customer is responsible for identifying the training attendees and for training additional personnel, as necessary, or contracting with Intrado to provide additional training.

10.0 ESINET DESIGN

10.1 REFERENCE DRAWING

Please reference file ***AZ NG9-1-1 Design***

10.2 INTERCONNECTING I3 NETWORKS

While technically capable, the Arizona Managed NG9-1-1 solution does not specify nor have cost allowances for interconnection with other i3 Networks. When a PSAP identifies the need for interconnection to other i3 Networks, cost and methods will be determined at that time. However, the below provides the process that would be used to complete the interconnection and how services might work.

Intrado/CENTURYLINK assumes that the entire state of Arizona will first be moved to an IP-based Selective Routing solution. Once implemented, the IP Selective Router solution will support IP enabled (non-i3) PSAPs, legacy PSAPs and i3 PSAPs throughout the state, simultaneously. Since all TN subscriber location information is stored in a common database, which simultaneously supports LIS HELD queries, CIDB Additional Data queries, and legacy ALI queries, the capabilities of the PSAP will determine which interface will be utilized to retrieve location data. If all PSAPs involved in a bridge/transfer have transitioned to i3, they would utilize the Emergency Incident Data Document (EIDD) to exchange location data and any other supplemental data or alternatively URIs to the dereferencing systems that would provide the data or data updates to the PSAP.
The Intrado/CENTURYLINK ESInet supports interconnectivity with both neighboring i3 and legacy networks. As a transition solution, Intrado/CENTURYLINK will provide a Legacy Selective Router Gateway (LSRG) between the ESInet and the legacy Tandem routers. This makes possible the following services:

Allow i3 PSAPs on the ESInet to receive 9-1-1 calls from the Legacy Selective routers until TSP's have migrated their circuits over to the ESInet.

Allow call transfers with additional information, such as ALI, and depending on CPE, case notes and TTY, between PSAPs still on the legacy tandems and an i3 PSAP on the ESInet.

Allow call transfers between i3 PSAPs on the ESInet and PSAPs on the legacy tandems. Call transfers between i3 PSAPs will support additional information, such as PIDF-LO, and depending on CPE, case notes and TTY.

Intrado/CENTURYLINK will also support ingress and egress i3 SIP to support both i3-compliant TSP traffic and interconnectivity with other i3 networks, e.g. in-state regional networks or neighboring state networks. Calls received from i3-compliant TSPs and transferred in from neighboring i3 networks will be delivered according to the PSAP-defined routing policy. Intrado's ESRP will also support configuration for transfers to neighboring ESInets via egress i3 SIP.

For Text-to-9-1-1 transfer services, Intrado's TCC now supports a variety of "in-band" commands that can be sent by the PSAP to invoke certain feature-specific actions on TCC such as the transfer function to other PSAPs that are using Intrado for Integrated, Web, or TTY. The transfer functionality also allows the PSAPs involved in a transfer to chat privately when conferencing in the PSAP that the conversation will be transferred to. Upon transfer to another PSAP the entire dialog that had previously taken place will be transferred to the accepting PSAP. Upon transfer the last location known will be forwarded in the initial message to the accepting PSAP.

Note that at the time of this response, there are no industry standardized requirements that have been developed for the transfer of text sessions between PSAPs served by different TCC providers. Intrado has implemented their own solution in order to support transfer capabilities between PSAPs served by the Intrado TCC until such time that standards are developed or an agreement between TCC providers has been reached to support these capabilities.

Text-to-9-1-1 interoperability between TCC providers is supported in the Intrado text solution and has been implemented per J-STD-110.a. Please refer to figure 1, depicting how the reference architecture is extended with multiple TCCs. Figure 1 shows the reference points required to support text routing/delivery and location dereferencing in the scenarios where geography and/or interconnection arrangements require such communication. The extended reference architecture provides the flexibility

to invoke those components of the TCC that are needed to support text communications between a given origination and destination point via the desired path. The functional entities within a given TCC that actually get invoked to support text message delivery will depend on where the text comes from, where it is going and what connections and agreements exist to get it from its source to its destination.

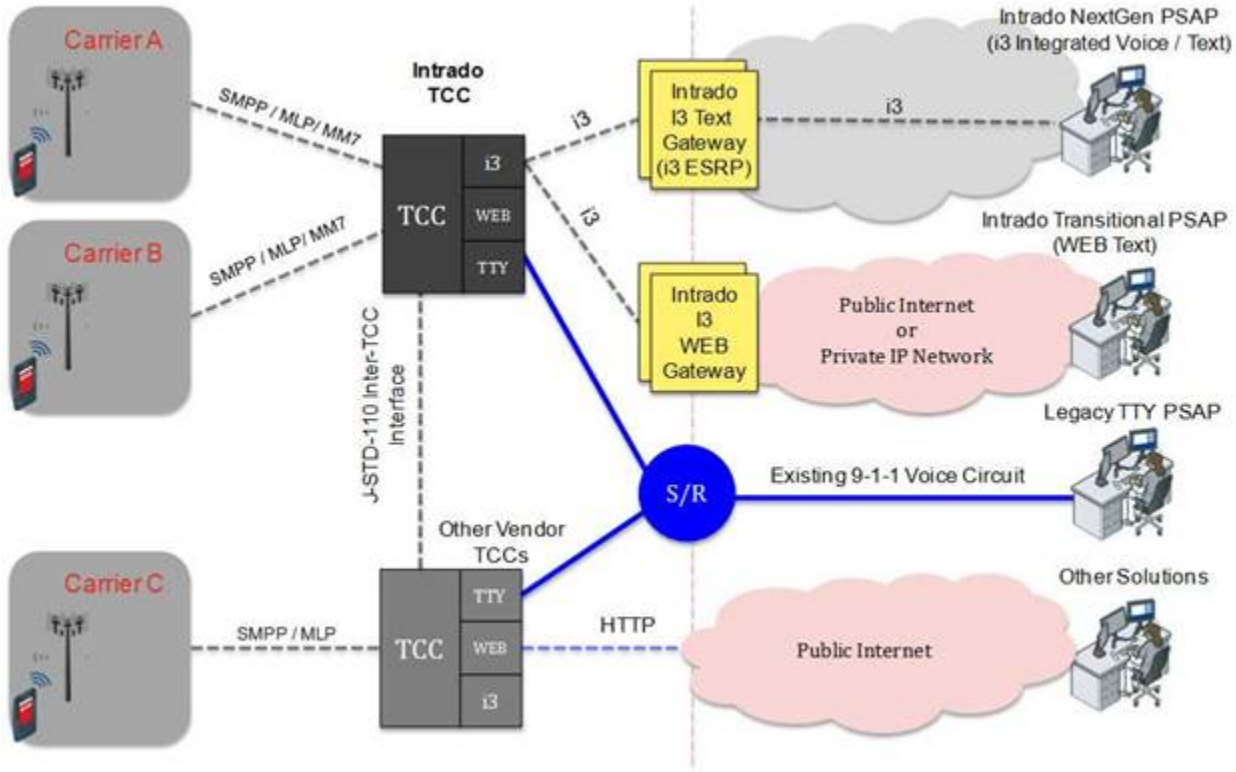


Figure 1 – Text Interoperability

The Intrado i3 solution supports flexible transfer and bridge capabilities for each Customer PSAP as follows:

The Intrado ESRP supports N-way (multiparty) bridging and call transfers using i3 SIP REFER and subscribe/notify messaging. i3 PSAPs can transfer calls to both i3 and non-i3 PSAPs, although N-way bridging is supported only for ESInet call participants.
Intrado's ESRP can also support star code transfers through the Customer PSAP CPE.
Intrado's LNG/ESRP supports the following NENA i3 protocols and interfaces:

- HELD protocol to communicate with the LIS
- Additional Data protocol for the CIDB
- LoST for ECRF communications
- i3 SIP

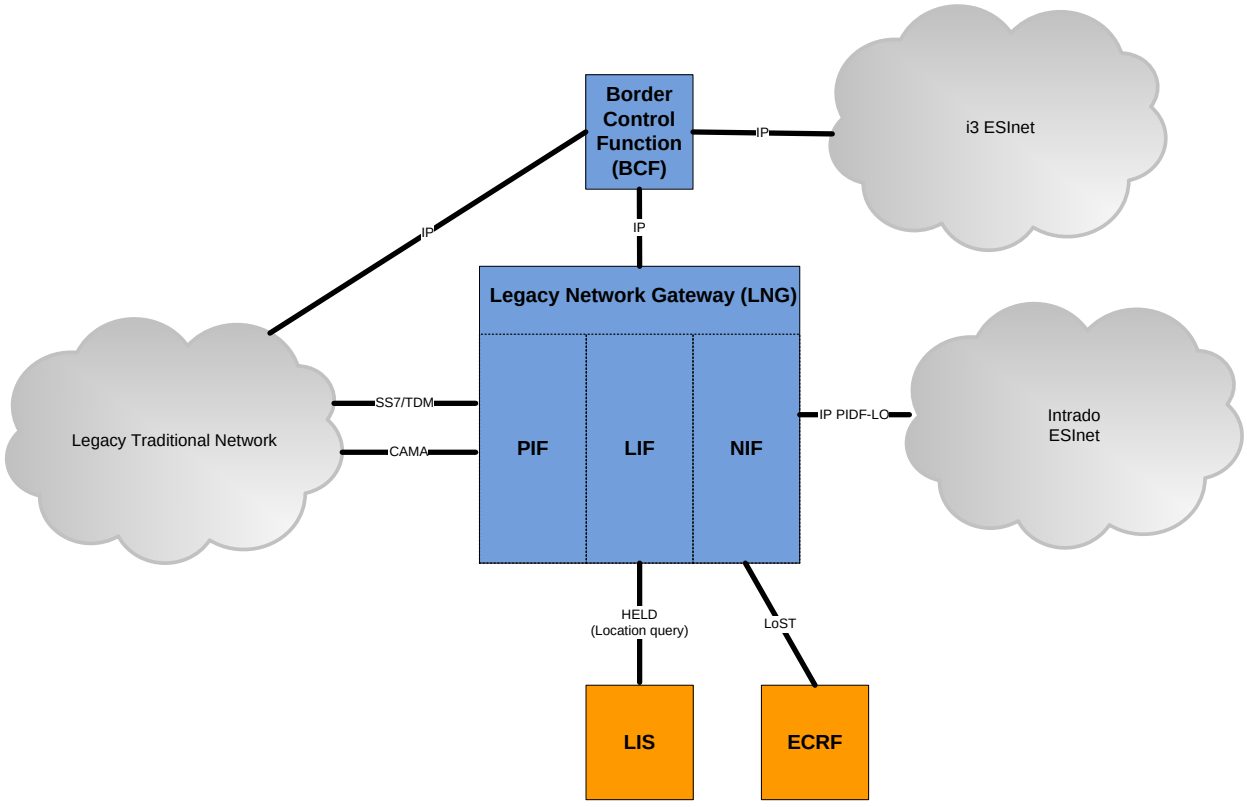
Physical points of interconnect for the ingress network, Intrado will partner with CENTURYLINK to ensure all carriers connect to the Intrado LNG.

10.3 LEGACY NETWORK GATEWAY (LNG)

The Legacy Network Gateway (LNG) and Legacy Selective Router Gateway (LSRG) are signaling and media interconnection points between callers in the legacy originating networks and the i3 architecture. The LNG provides the NENA i3 specified NG9-1-1 specific Interwork Function (NIF), Protocol Interworking Function (PIF) and Location Interwork Function (LIF).

The CENTURYLINK and Intrado LNG function will interface the legacy 9-1-1 network to the Intrado ESInet. The LNG will convert CAMA and TDM/SS7 calls to IP within the Protocol Interwork Function (PIF) to support any 9-1-1 call received from the legacy network that is not IP based.

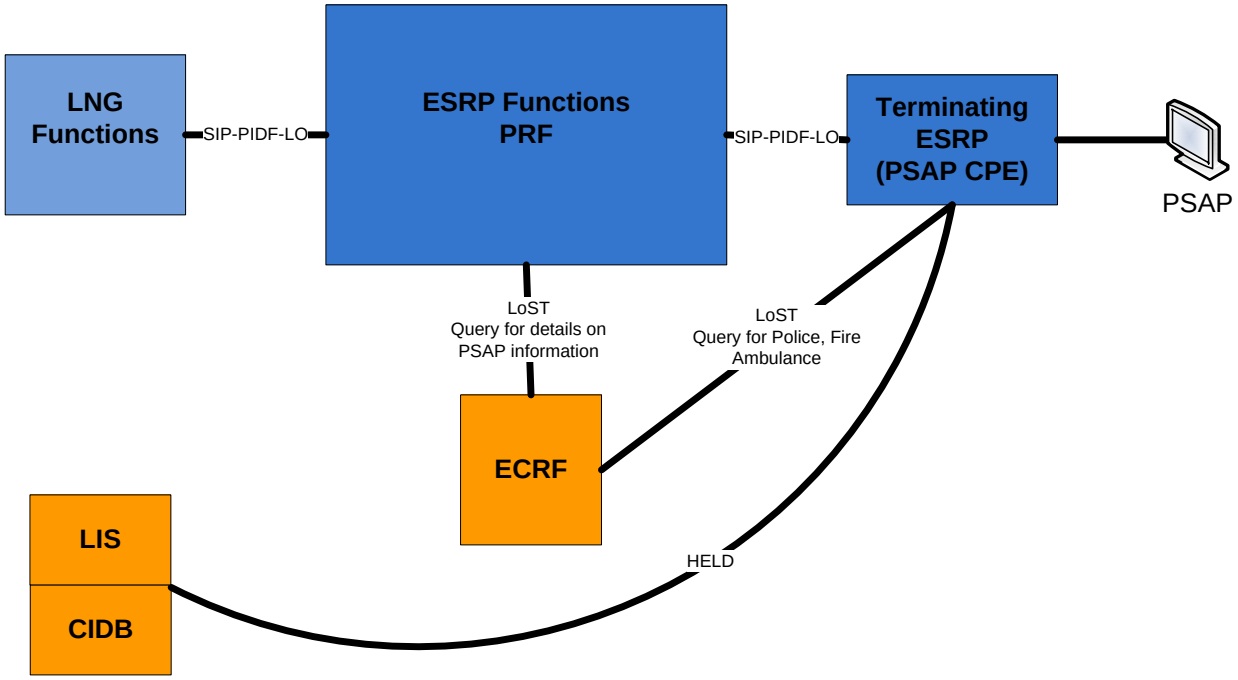
The LIF utilizes a key from the incoming signaling to retrieve location information from the Location Information Server (LIS) using the HELD protocol. The LIF also retrieves Additional Data associated with the call from the Call Information Database (CIDB) using the "Additional Data" protocol as specified by NENA. The location and additional call information is provided to the NIF to be passed to the ESRP for use in determining the route and populating the SIP messaging to the PSAP. The NIF will generate the SIP PIDF-LO (Presence Information Data Format-Location Object). PIDF-LO is a SIP message that has location information embedded in an XML format within the SIP invite.



LNG Function

When the ESRP (Emergency Service Routing Proxy) receives the PIDF-LO message, the ESRP may query the appropriate ECRF to determine the next hop for the 9-1-1 call. The Intrado ESRP contains the routing logic that routes the call to the appropriate terminating ESRP, also known as the PSAP's hosted VIPER or VESTA call handling system. The hosted call handling solution will function as the terminating

ESRP and will have the ability to query the CIDB, LIS, and ECRF to accurately represent the call's information and associated jurisdictional information on the workstation. This includes the ability for the call handling system to query the ECRF to obtain specific information about which Police, Fire, and EMS supports the caller location, based on the GIS information received within the PIDF-LO message. These functions will be part of the hosted call handling service.



10.4 Legacy Network Gateway – Arizona Specific

As customer PSAPs migrate to an ESInet solution, there will continue to be the need for these NG9-1-1 enabled PSAPs to receive wireless and wireline calls from legacy TDM networks and from legacy PSAPs. In compliance with the NENA i3 defined solution for interconnecting legacy networks and the Emergency Services Information Network (ESInet), CENTURYLINK will deploy two Legacy Network Gateways (LNG)s in Arizona at the following data centers:

INVOTA DATA CENTER – 1215 E Pennsylvania St, Tucson AZ 85714
IO DATA CENTER – 615 N 48th St, Phoenix AZ 85008

At each LNG, CENTURYLINK will install Gateways where calls originating on the legacy network will be converted to IP for transport over the ESInet to the Intrado Emergency Call Management Center and then on to the i3 enabled, or NG PSAP.

As a PSAP is migrated to a NG PSAP, CENTURYLINK will replace the existing EM trunks from the Legacy Selective Router (LSR) to the PSAP with SR trunks from the LSR to the LNG Gateways. CENTURYLINK's recommended design will be a ratio of (1.3) ES trunks for every (1) legacy EM trunk. Additionally, trunks from the LNG to the LSR are needed to support call transfers from NG PSAPs to Legacy PSAPs or vice versa, which may also impact the required ratio. During the migration of PSAPs from the legacy network to the ESInet, CENTURYLINK will monitor the traffic volumes and may adjust the number of ES and LSR transfer trunks up or down, as needed.

CENTURYLINK ES trunks are configured in a Primary / Secondary overflow pattern (never load shared). In the solution for Arizona, half the ES trunks from the LSR are honed to one of two LNGs, while the other

half is honed to the second LNG. In the event that a LNG is lost, an Arizona NG PSAP will still maintain full service levels similar to how all Arizona PSAPs are currently provisioned with N+1 redundancy through dual tandems.

As the PSAP is migrated to a NG PSAP, CENTURYLINK will update the routing in its LSR and based on ESN, deliver the call over the EM trunks to a legacy PSAP or over the SR ES trunks to the LNG and then over the ESInet to a NG PSAP. Call setup times are dramatically improved when processed through the LNG to the IPSR with an average call setup time of 600ms.

10.4.1 Independent CSPs

Independent CSPs legacy selective routers (LSR) can be honed to the LNG. Per customer request, the LNG design provides the interface for other service providers, such as Frontier, to enter the Arizona ESInet. The originating call can be from a legacy network or IP enabled network.

Intrado and CENTURYLINK encourage the direct connection of CSPs to the LNGs; however, this is not in scope of this project. Timing can depend on the Carriers, and on factors not under Intrado or CENTURYLINK's control.

CENTURYLINK acknowledges the customer's desire to allow wireless CSPs to direct connect during Phase One of the project. Allowing CSPs to direct connect during Phase One implementation brings on new project risks and will take additional planning and coordination to accomplish. This would include, but not be limited to:

- Negotiation of Interconnect agreements
- Determining costs for interconnection
- Solution Design
- Solution Implementation
- Solution Testing

CENTURYLINK and customer will evaluate any requests for direct wireless CSP connection after the first successful Phase One PSAP migration. In this evaluation, CENTURYLINK and customer will determine project risks from the extra efforts required for wireless CSP interconnection.

If both parties agree that the inclusion of direct wireless CSP interconnection to the i3 network poises low risk to a successful Phase One deployment, then such interconnection will be allowed. If, at any time after including wireless CSP interconnection, it is determined that successful deployment of Phase One is in jeopardy, CENTURYLINK may delay wireless CSP interconnection at its discretion.

If it is determined that inclusion of direct wireless CSP interconnection to the i3 network poises to high of a risk to include in Phase One deployment, CENTURYLINK and customer can complete all planning required during Phase One deployment so that implementation of direct wireless CSP interconnection to the i3 network can commence at an agreed date following Phase One deployment.

10.4.2 Proper Gateways for Service Providers

Intrado supports ESInet ingress IP traffic via the NENA i3 and ATIS-0700015 "Standard for Implementation of 3GPP Common IMS Emergency Procedures for IMS Origination and ESInet/Legacy Selective Router Termination, August 2013". The IP Point of Interconnect (POI) supporting Session Internet Protocol (SIP) call delivery is the Intrado Border Control Function (BCF) at each of the geographically diverse Emergency Call Management Complex (ECMC) locations. The SIP interface can be used for carriers delivering i3 compliant interface with PIDF-LO or ESInet to ESInet call hand-offs and transfers.

Additionally, the SIP Ingress protocol can be used to support a transition strategy where IP protocols are used to replace TDM protocols as a means to providing better connectivity with redundant path routing and a transition from legacy to NG9-1-1 interfaces.

The process for migrating carrier traffic from the gateways to the SIP POIs is defined in detail and will be reviewed with the carrier when the migration process is initiated. A summary of the overall process to be led by an Intrado Project Manager (PM) is provided below:

- PM communicates the timeframes, dependencies and requirements for migration
- PM provides SIP interconnection specifications, industry standards and online ordering guidelines
- PM provides plans including schedules, milestones and deliverables and works with the carrier to establish capacity requirements, interconnection steps, etc.
- Connections are ordered by the carrier and established and tested with Intrado
- Upon successful completion of interconnection of carrier SIP virtual trunk groups from the gateway, the TDM trunk groups are disconnected

10.5 EMERGENCY COMMUNICATIONS MANAGEMENT CENTER

The Intrado Emergency Communications Management Center (ECMC) contains the systems required to support the NG 9-1-1 network for Arizona including the IP Selective Router (IPSR) and i3 functional components, including text gateways, and hosted applications. For the Arizona solution, the ECMC will also host the geo-diverse NG9-1-1 enabled VIPER system. There are two geo diverse ECMCs in the CENTURYLINK solution with one NG9-1-1 core node in Englewood CO and a second NG9-1-1 core node in Miami FL.

- 393 Inverness Pkwy, Englewood CO 80112
- 50 NE 9th St, Miami FL 33132

10.6 I3 FUNCTIONAL COMPONENTS

The CENTURYLINK solution provides all required NENA i3 functional elements to support a GIS based routing architecture as PSAPs are ready to move to this routing architecture.

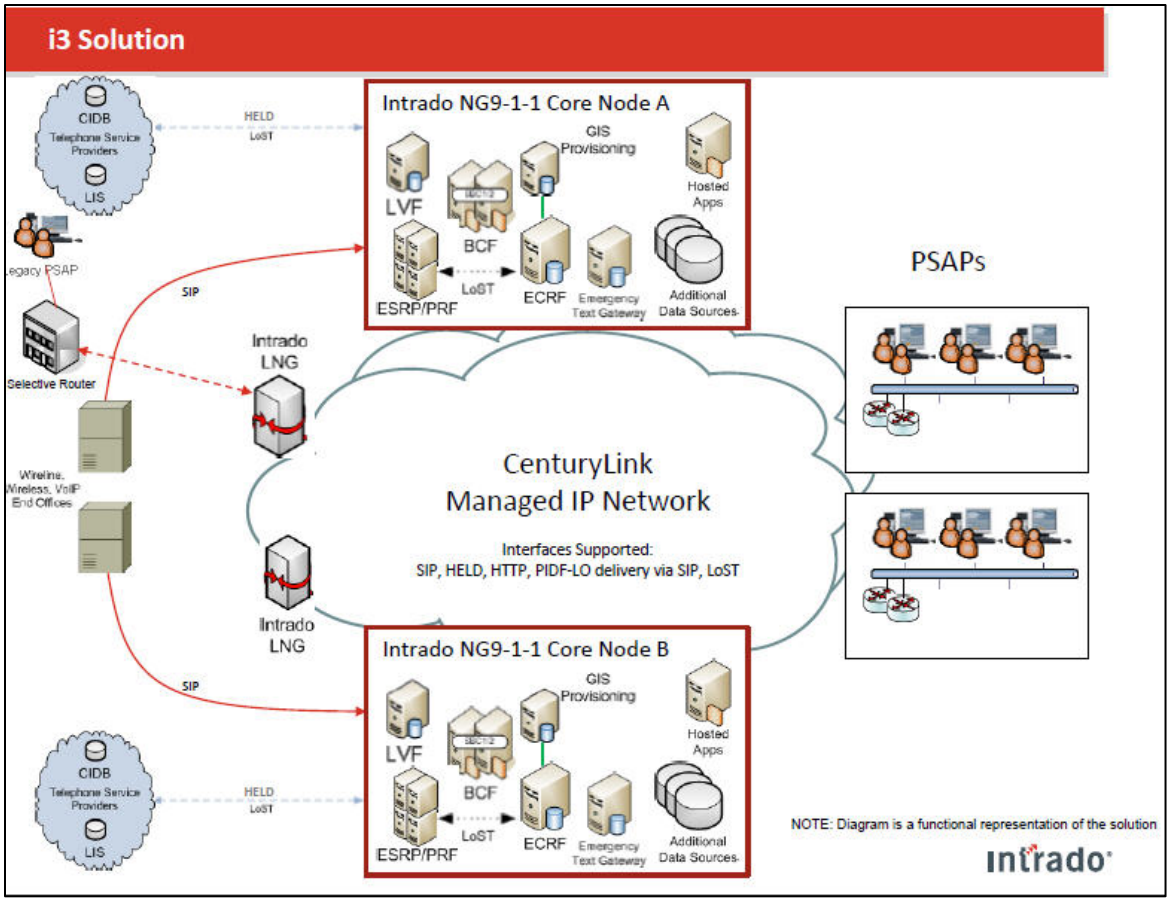


Figure 10.1 Functional Components of i3 Solution

10.6.1 Emergency Call Routing Function (ECRF) and Location Validation Function (LVF)

The ECRF provides full i3 compliancy housing Customer provided street centerline and point data, multiple geospatial routing boundary layers and utilization of the LoST (RFC 5222 compliant) interface for retrieval of police, fire, emergency medical services and other applicable service types.

Interface with the ECRF is via an i3-based LoST protocol interface. The Emergency Services Routing Proxy (ESRP) queries the ECRF via the LoST protocol to obtain the destination Uniform Resource Identifier (URI) for the call. Using the destination URI, the ESRP interfaces with the policy store to identify applicable routing policies. For geospatial routing policies other than Standard Routing or a Priority Override policy, the ESRP re-queries the ECRF via LoST to obtain the routing destination for alternate service types – e.g. abandonment, diversion requested or special event routing.

The ECRF supports multiple Geographic Information Systems (GIS) and service type layers which are leveraged to support geospatial queries via the LoST protocol. In addition to street centerline and point data provisioned via the GIS provisioning platform and SIF systems, the ECRF supports provisioning of multiple service types including:

- **Standard Routing** – The standard i3 routing boundary for each PSAP and the corresponding URI are pre-provisioned via the SIF and retrieved by the ESRP for use in determining the applicable routing policy.
- **Abandonment, Overflow, Diversion, and Special Event Routing** – In addition to standard i3 routing, the ECRF allows geospatial boundaries to be provisioned for multiple routing service types to support abandonment, overflow, diversion, and special event routing policies. Each assigned a unique URN. Provisioning via the ECRF ensures that alternate policy routing is based

on fully-validated GIS boundaries. Once provisioned, configuration changes made via the Policy Routing Function (PRF) User Interface can specify an alternate URN to be used for routing determination. Note that these capabilities are in addition to use of a Priority Override Polygon which would be provisioned directly to the PRF and for locations that fall within its boundary, would be used in place of an ECRF query to route calls.

- **Emergency and Additional Services** – The ECRF supports provisioning of separate boundary layers for first responder service types including police, fire and emergency medical services and additional find service types such as poison control, animal control, etc.

The ECRFs exist within a highly available and geographically distributed application processing environment. A single hardware component failure at one of the data centers will not interrupt processing of the ECRF. A single data center failure will not prevent further call processing from occurring. High availability is achieved through high availability software design, redundant ECRF instances, and transactions using dynamic client/server connections with multiple ECRF serving entities.
It is expected and recommended that a single statewide ECRF configuration will be implemented, with the ECRF containing coalesced data from all participating entities within the state. The ECRF can optionally be implemented in a hierarchical configuration where regional ECRFs recurse to a statewide ECRF to retrieve a response from another regional ECRF serving a different region.

Where possible, static locations provisioned to the Location Information Server (LIS) will not only contain a location validated civic element, but also the supplied or derived latitude and longitude associated with the civic address. The Intrado geocoding platform utilizes the same GIS Customer data source as the ECRF and LVF (Location Validation Function) and is also provisioned via the SIF. The Intrado geocoding platform supplies the geodetic element (latitude and longitude) to be provisioned to the LIS along with the validated civic element.

Where point GIS data is provided by the Customer, latitude and longitude will be directly utilized via the attributes provided. When point GIS data is not available, but street centerlines are provided, the latitude/longitude will be interpolated using industry standard geocoding technologies, and the resulting latitude/longitude will be associated with the LIS record. The ESRP will send the latitude and longitude as the preferred location element to the ECRF to determine the appropriate PSAP for routing. The ECRF utilizes this latitude/longitude to perform a point-in-polygon lookup to return the appropriate URI for the PSAP associated with the polygon the latitude and longitude falls within. When geodetic location elements are unavailable, routing and other services can also be determined based on the validated civic address element.

The GIS data layer(s) that are used to identify the PSAP, emergency, and additional service types are configured on a per-service basis, e.g. urn:service:sos. If a LoST query contains the geodetic location and a routing Uniform Resource Name (URN), the geodetic location will be used to directly query the PSAP boundary layer and identify the target PSAP. The GIS polygon set that is queried is based on the service URN of the query.

The ECRF supports provisioning of separate boundary layers for first responder service types for police, fire and emergency medical services, as well as optional service types, such as poison control, as long as the polygon datasets are provided with the GIS data. The i3 compliant PSAP may query the ECRF for additional service URNs associated with the location or to identify the URI of an Additional Location Data Repository (ALDR) if one is provisioned for the specific civic location. For each service URN the Customer would like to support, polygon sets must be included for SIF validation and implementation into the ECRF.

Customer GIS updates are provisioned through the Intrado Spatial Information Function (SIF) which performs GIS validations, including those that ensure routing integrity. The Intrado SIF's unique field mapping capabilities allow data to be presented by different Customers using unique schemas, provided all mandatory data elements are included. Validated GIS updates are normalized and applied to the ECRF production instances in a manner that preserves availability and coordinates with other ESInet scheduled updates and activities. The SIF can accept data from GIS data sources as often as the

Customer's data update workflow requires. Once the data is received by the SIF, the ECRF will be updated within three (3) hours. A change control model is implemented to track changes between the GIS provisioning platform and the production ECRF instances. Extensive QA/QC validations are performed within the SIF process to eliminate the provisioning of erroneous data to the ECRF. If it is necessary to revert to a previous version of the data, Intrado's SIF can re-provision the ECRF with a previous version of the customer provided data at the customer's request. Intrado stores the past copies of the GIS data for 6 months in the production system. The re-provisioning time frame would depend on the amount/size of the data, and would be on the order of the time frame for the original update to occur. Typically 3 hours as indicated above.

The Quality Assurance/Quality Control (QA/QC) processes provided during validation steps in the SIF will prevent any unwanted gaps or overlaps being provisioned in the ECRF. As an added value and per NENA i3 guidelines for ECRF gap and overlap handling, if any boundary gaps exist, the ECRF handles them by selecting the nearest boundary, as long as the boundary is within a configurable threshold distance from the location. For boundary overlaps, the ECRF assumes both are valid and, since only one URI can be returned per the NENA guidelines, picks a single URI to include in the response. NENA specified Gap/Overlap event notifications for Gaps/Overlaps exceeding a configurable threshold are provided at configurable intervals to the GIS data providers.

Intrado's 9-1-1 Enterprise Geospatial Database Management System (EGDMS) services are optionally available, at no additional fee, to assist multiple agencies to collaborate and resolve boundary conflicts when GIS data from these multiple sources are coalesced.

The CENTURYLINK solution includes an Emergency Call Routing Function (ECRF) and a Location Validation Function. As the PSAPs transitions from a Tabular MSAG and ESN based routing to GIS based routing, the required ECRF and LVF elements will be available.

10.6.2 Location Validation Function

The Location Validation Function (LVF) provided will be physically separate from the Emergency Call Routing Function (ECRF). The LVF and ECRF are populated from the same GIS (Geographic Information System) sources and no unique GIS data requirements exist for either function.

Location to Service Translation (LoST) servers, specifically dedicated for LVF functions, will be implemented independently of the ECRF for authorized carrier access to the validation functions. This architecture ensures that potentially high-volume validation functions never interfere with the ECRF functions of emergency call routing and determination of first responders for a given location.

As with the ECRF, the LVF will utilize the Customer's GIS data provisioned via the SIF and will determine whether or not the civic address provided in the LoST request is valid. The LVF responds per the NENA i3 standard (NENA 08-003) and the specified Internet Engineering Task Force (IETF) standards (RFC5222).
To complement the LoST protocol interface into the LVF, a map-based graphical user interface (GUI) will be available to authorized users. This interface, accessible via a secure web interface, is designed to facilitate the finding of LVF-valid civic addresses for CSPs otherwise unable to validate a location via the LVF using the LoST protocol interface.

The LVF is deployed in a fully-redundant, highly available (99.9%) environment to ensure immediate responses to the LVF LoST queries. It is critical to note: the solution component services, which are utilized during live 9-1-1 call processing and which could include an "LVF LoST Query" during call time will be designed for 99.999% availability. Our LVF component (LVF with Locology, which is the provisioning interface) is designed to meet/exceed 99.9% availability. This is in concert with the direction from NENA i3 standard and the ongoing working group. The attached NENA document discusses the differentiation in Section 3.4 on Page 23 and provides guidelines for availability. Generally Five 9s for runtime systems and network components and two to three 9s to other functional elements. Clients must access the LVF via secure protocols; Secure Sockets Layer (SSL) versions 2 and 3 and Transport Layer Security (TLS) versions 1, 1.1, and 1.2 are all supported.

Mutual authentication will also be employed, so it is expected that both the client and LVF will be configured with valid digital certificates issued by their designated PSAP Credentialing Agency (PCA). At the time of Intrado's response, a PCA does not exist. Without a PCA, credentials will be issued by a trusted credentialing entity.

The LVF is in a secure network using an Intelligent DNS infrastructure to provide a high level of performance, availability and security. Behind the Intelligent DNS infrastructure, additional state-of-the-art network elements provide high security against even the most aggressive malicious network attacks. All fixed location (wireline) telephone number (TN) records must be validated against the Customer's GIS data prior to being loaded into the Location Information Server (LIS) and Automatic Location Identification (ALI) systems. The database management system used to process and validate Service Order Input (SOI) from communications service providers (CSPs) maintains a copy of the validated record and the data used for SOI validation is sourced from the Customer's GIS data. Anytime the underlying GIS data is updated, the database management system searches for any TN records that may be impacted by the change. For those affected, it then immediately revalidates the record and either updates the LIS and ALI or flags it as an error for the Data Integrity Unit (DIU) analyst, who will work with the carrier and/or the Customer's designated coordinator(s) to resolve. During the transitional phase toward a full i3 model, this process bypasses the need for periodic (e.g., every 30 days) LIS record revalidations and ensures the LIS/ALI records are kept as current as possible.

For authorized CSPs who have chosen to provide their own LIS, the LVF is also available to validate their subscriber's location information prior to provisioning, as well as for periodic revalidation as needed. Please note that this LoST server instance will always be separate from the ESInet ECRF instance involved in 9-1-1 call routing.

Depending on the capabilities of the PSAP CPE to utilize locally available GIS data (i.e. data provisioned for the ALI mapping display), when a 9-1-1 call involves a reporting party that is not located at the site of the emergency, the LVF LoST server and complimentary map-based GUI will be available to the call taker to determine the valid address provided by the caller.

10.6.3 Border Control Function

The CENTURYLINK solution will include Border Control Function with Firewalls (FW) and Session Border Controllers (SBC). The FW and SBC provide the required Border Control functions (BCF) for security and provide the means for prevention, detection, and reaction to security events to ensure reliable 9-1-1 call delivery. The BCF sites between external networks and the ESInet and all traffic transiting between these networks must flow through the BCF.

The solution provides all the required NENA specifications for an ESInet BCF including:

- Application layer scanning and protection
- Network layer scanning and protection
- Denial of Service (DoS) detection and protection
- Malware detection and protection
- Identification of emergency call sessions and priority handling of IP traffic
- Facilitate forwarding of emergency calls
- Protection against Distributed Denial of Service Attacks (DDoS)
- SIP Protocol Normalization
- Network Address Translation (NAT)
- Quality of Service (QoS) markings

10.6.4 Emergency Service Routing Proxy (ESRP) and Policy Routing Function (PRF)

The Emergency Service Routing Proxy (ESRP) delivers NENA i3 defined routing functionality, including full integration with geographically determined routing policies, carrier-grade voice quality, and demonstrated reliability. The ESRP interfaces with the Location Information Service (LIS), the Emergency Call Routing Function (ECRF) and the Policy Routing Function (PRF) to identify and route the voice call to an available PSAP (Terminating ESRP). Intrado's i3 Routing solution supports queue

management and provides PSAPs with control over managing their routing policies from a flexible array of options.

10.6.5 ESRP Overview and Interface Compliance

The ESRP processes ingress calls received using Session Initiation Protocol (SIP) signaling with location embedded in the Presence Information Data Format – Location Object (PIDF-LO) from i3-compliant carrier networks, from legacy carriers or from selective routers via the Legacy Selective Router Gateway (LSRG) and routes calls to the call processing system (CPS) and then on to the PSAP location, according to the caller's location and the PSAP-configured routing policy.
When the ESRP receives an ingress call, it evaluates the SIP INVITE geolocation header within the PIDF-LO. If the geolocation header contains location by reference, the ESRP queries the Location Information Server (LIS) via the HELD interface to dereference the location and obtain a routable geodetic or civic location value. The ESRP then queries the Emergency Call Routing Function (ECRF) via the Lost to Service Translation (LoST) protocol with the caller's geodetic or civic address location to identify the call's destination Uniform Resource Identifier (URI).

Using the location-determined URI retrieved from the ECRF via the LoST protocol, the ESRP interacts with the Policy Routing Function (PRF) to determine call routing. Policy route determination includes evaluation of the PSAP-configured routing policy, the time-of-day, the caller's location (for geospatially-determined alternate routing policies), the PSAP's operational state, and the ring-no-answer timer configuration. Emergency override policies supersede pre-provisioned policies when the call falls within the PSAP-defined routing polygon. This solution enables PSAPs to quickly implement emergency routing policies during emergent events that require calls to be sent to supporting agencies.
Intrado provides and maintains the following i3 interfacing specifications for providers and vendors of interfacing components. Each specification details the RFCs supported and interface implementation details:

- CIDB-Additional Data Interface for A9-1-1
- LIS-HELD Interface for A9-1-1
- ECRF-LoST Interface for A9-1-1
- ESRP Terminating Interface for A9-1-1

Intrado has been actively testing i3 interoperability with all leading i3 CPE (Terminating ESRP) providers and discussed implementation on interface details to develop or to identify as roadmap items until the standards have stabilized. The NENA i3 interface standard is continuously evolving as NENA works to gain consensus on Version 2 of the standard. Intrado is actively engaged in NENA and IETF standards committees to provide recommendations and feedback on standards evolution.

10.6.6 Policy Routing Function (PRF)

Intrado's Policy Routing Function (PRF) supports queue management and provides PSAPs with extensive flexibility to define and update standard and alternate routing policies. PSAPs can dynamically modify routing policies, submit routing polygons, set priorities, and modify their queue (operational) state. Routing policies can be defined as recurring or one-time, and priority override polygons can be submitted on-the-fly for emergency re-routing.
Intrado's i3 rules-based routing proxy includes the following elements:

- **Policy Store:** Acts as a repository of PSAP-defined routing policies and policies based on ingress call path or call type.
- **Browser Interface:** Provides a feature-rich management portal that allows PSAPs to customize Emergency Services Routing Proxy (ESRP) configurations, define and edit their routing policies, and modify their status (normal, abandoned, diverted). All routing policy changes are automatically verified for syntactical and logical accuracy prior to activation in production. Secure user access is provided via the provided web management portal.
- **ESRP Retrieval and Routing:** Performed based on PSAP-defined routing policies.

The policy store supports the following types of routing policies:

- **Abandonment Routing:** The abandonment policy is engaged whenever the PSAP operational state is defined as "Disabled."
- **Overflow Routing:** The overflow routing policy is applied during overflow scenarios when a PSAP is receiving more calls than its occupied work stations can accommodate. Upon reaching the designated call capacity for the call type, cumulative calls, or if the target is unreachable, the ESRP engages the primary PSAP's overflow routing policy. The alternate routing policy will be invoked if the terminating ESRP's call processing system does not accept the SIP INVITE or for a ring-no-answer timeout.
- **Diversion Routing:** The diversion routing policy is applied whenever the PSAP engages alternate diversion routing rules, or it can be configured to apply during a recurring time window. The PSAP operational state may be modified to engage the diversion routing policy by contacting the CENTURYLINK 9-1-1 NOC, or modified via the provided web management portal.
- **Special Event Routing:** Special event routing is a diversion routing policy that is applied during a scheduled time window. If a PSAP jurisdiction contains venues that host events (e.g., concerts, sporting events, etc.) that may warrant dedicated call handling (alternate locations or dedicated resources at the PSAP), special event polygons can be pre-provisioned via the ESInet Spatial Information Function (SIF), submitted via the provided web management portal.
- **Priority Override:** During an emergency scenario when call routing needs to be redrawn on-the-fly without the rigor of full Geographic Information System (GIS) validations, the ESInet allows PSAPs to enter and/or import routing polygons via the i3 policy editor. Priority override polygons can be defined as point and radius or as defined polygon boundaries.

Intrado provides a feature-rich policy editor, accessible via the provided web management portal, for PSAPs to customize and maintain their policies, whether textual or geospatial. Geospatial policies can reference shapes pre-provisioned in the Emergency Call Routing Function (ECRF) or can reference a shape attached to the policy. A shape attached to the policy can either be a shape file or a description of a shape (points and, optionally, distances). An example would be a latitude, longitude and a radius to describe a circle or multiple latitude and longitude points to describe a polygon. Policies also have other attributes like active/inactive; one-time or recurring time window; priority; Uniform Resource Identifier (URI) or a set of URIs of the destination(s) to send the call to; and call distribution method, to name a few. These policies can be pre-provisioned or can be constructed in real time based on the incident.

The ESInet supports a SIF interface for provisioning of geospatial routing policies into the ECRF. Geospatial routing policies are applied to the ECRF after all GIS and routing validations have been completed.

Abandonment, Overflow, and Diversion Routing policies can be configured to use any of the following policies:

- **Geographical:** The system can be configured to send abandonment calls to different alternate PSAPs based on the geographic location of the calling party within the primary PSAP's jurisdiction. Geographic abandonment or alternate routing polygons can be pre-provisioned via the SIF or submitted dynamically.
- **Hierarchical:** The system can be configured to cascade a call to up to nine consecutive alternate PSAPs.
- **Load-balanced:** The system can be configured to distribute calls between up to nine alternate PSAPs.

10.6.7 Event Logging Service

For Customers with the Intrado A9-1-1 i3 Routing solution, Intrado will provide an i3 compliant logging service which aggregates logs from Intrado ESInet, i3 compliant Terminating ESRPs (CPE) components to support end to end transaction logging and retrieval.
The Intrado i3 logging service includes a web service that supports logging and event retrievals. All significant steps in processing a call are logged and submitted to the ESInet logging service, and each log contains a transaction ID to support log aggregation. The i3 logging service is compliant with the i3 specification for recording transaction metadata for all payloads to provide end-to-end reports.

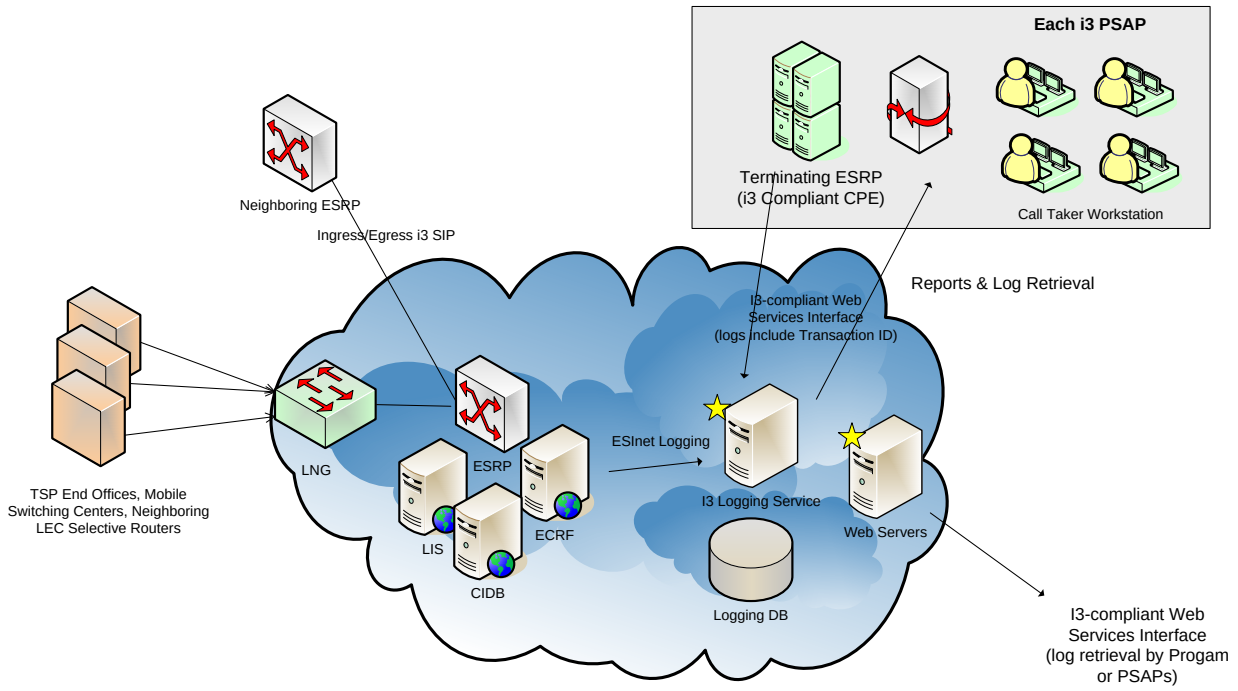


Figure 2 – Intrado i3 Logging Service

Intrado's Enterprise BI Reporting Tool, Microstrategy® from Intrado, will provide a web-based interface to allow the PSAPs and Program to review and retrieve i3 Logging transactions and events including text conversations and data validation metrics. Intrado will support retrieval of logs and events via the web interface and the web services interface including the following retrieval options defined in NENA 08-003 v2 Detailed Functional and Interface Specification for the NENA i3 Solution, 20140326 Draft:

- RetrieveLogEvent
- ListEventsByCallId
- ListEventsByIncidentId
- ListCallsByIncidentId
- ListIncidentsByDateRange
- ListIncidentsByLocation
- ListIncidentsByDateAndLocation
- ListCallsByDateRange
- ListAgenciesByCallId
- ListAgenciesByIncidentId

As the NENA XML Schema Definitions for logging are in the process of being finalized at the time of this response, the i3 logging service, web interface, web services interface and associated reports are currently under development with an anticipated release date of Q2- 2015.

10.6.8 Forest Guide

Please note that NENA has provided clarifications that state what in the past has been referred to by some as a "statewide Forest Guide," should be referred to as a "statewide ECRF." The NENA vision is for these statewide ECRFs to utilize an iterative request to a national Forest Guide to determine the correct statewide (or otherwise) ECRF that is authoritative for the location element(s) provided in the original LoST request.

The RFC 5222 compliant Intrado ECRF has the capability of serving a regional ESInet as well as providing ECRF functions in support of an entire state, provisioned with GIS data for all i3 capable regions within the state. It is also capable of working in a hierarchical fashion as either the state level or regional ECRF. In this configuration, the parent (state) ECRF knows the coverage areas of all child ECRFs within the state, with the capability of performing recursive queries to child ECRFs and returning the LoST responses to the requesting child ECRF, assuming data exists for the region in question. While no National Forest Guide is in existence for the United States, the Intrado ECRF has the capability of serving that capacity, given access to coverage areas and URIs for other existing ECRFs within the country.

The ECRF provides full i3 compliancy housing street centerline and point data, multiple geospatial routing boundary layers and utilization of the LoST (RFC 5222) interface for retrieval of policy, fire, emergency medical services and other applicable service types.

11.0 i3 Migration Process

Intrado/CENTURYLINK will design the network connectivity to support the A9-1-1 Routing, A9-1-1 Location Data Management and TXT29-1-1 data solutions for the Customer. The design will conform to industry best practices and Intrado security policies. Intrado/CENTURYLINK requires geographic diversity, redundancy, and diverse connections to the PSAPs it services for ALI, and A9-1-1 Routing services. Likewise, Intrado/CENTURYLINK requires geographically diverse and fully redundant and diverse connections from telephone service providers to at least two Intrado demarcation points into the ESInet.

Intrado prepares the 9-1-1 database management system by loading in the MSAG as provided by the customer. Simultaneously, Intrado works with the telephone service providers to assist them in the preparation for the ALI transition. This involves the facilitation of Telephone Number (TN) simulations and resulting error corrections with the TSPs to ensure that the TN error rates meet/exceed the desired threshold (as agreed by the PSAP) before final load and ALI flash-cut.

Once ALI transition has completed, the transition of end offices to the 9-1-1 Routing solution begins. As each telephone services provider's end offices are connected to the Intrado network, Intrado will work with the TSP to conduct pre-cut test calls to ensure accuracy of translations before cutting the live traffic from the end office to the 9-1-1 Routing solution.

11.1 Development Lifecycle

Intrado's approach to plan, configure, network engineer, implement, test, document, train, and support Intrado Service follows Intrado's solution lifecycle methodology. The lifecycle begins with solution definition and architecture activities. During these initial phases, the joint Intrado team and Customer team members verify system application and implementation requirements, refine the solution architecture, and finalize the plan for solution migration and deployment. Following definition and architecture phases, the team orders, installs, configures, tests, and trains users on customer-facing solution components as part of solution integration and deployment effort. Following successful deployment, the maintenance phase begins. The primary goal of the lifecycle methodology is that the project aligns with overall customer expectations, and is tailored to fit the needs of the Customer. The Project Plan phases are described below.

Figure 12 Project Plan Phases

11.2 SOLUTION DEFINITION

The first phase in the solution lifecycle is the Solution Definition phase, which begins with the kickoff and alignment process and is critical to the overall success of the 9-1-1 initiative within the state. During this process, key members of the joint project team unite to identify roles, responsibilities, critical success factors, project challenges, elaborate on specific strategies and project options, confirm Next Gen 9-1-1 project scope, and finalize plans to expedite solution delivery plans and resources. The solution is reviewed in order to align each primary stakeholder with a common vision and strategy for unified team design and planning.

The Intrado team conducts current systems, processes, and site studies to more clearly understand the current system and user environment, allowing the team to plan the most effective migration path to the new system.

11.3 SOLUTION ARCHITECTURE

During the Solution Architecture phase, the detailed solution design is finalized based on confirmed requirements. During this phase, the team analyzes the current systems, operations, and operational procedures, identifies the human factors needs, considers implementation options, and with the Customer, commits the detailed solution design and implementation schedule.

Stakeholder participation to identify processes and standard operating impact is critical in this process to support a successful integration of the new system. It is vital that current procedures, connectivity, and routing policies are examined so that the appropriate practices are carried forward to the new system environment. Examples of important areas considered include load balancing, alternate, backup, and default routing rules.

Initial planning for connectivity from the existing legacy selective router and telephone service providers to the Legacy Network Gateways (LNGs) also begins in the architecture phase. The recommended migration strategy uses the legacy selective router during the migration period to aggregate and handoff traffic by ESN to support flash cuts by PSAP and then rehome end offices and MSCs post PSAP conversion. Key solution architecture planning activities include:

- Detailed solution design and schematics (onsite, site to site, site to Intrado, firewalls, routers, etc.)
- IP specifications
- Telephone service provider connectivity specifications
- Physical requirements (e.g., equipment room design, floor loading)
- Call transfer requirements
- Training plan and schedule

- Refined project plan and timeline

11.4 SOLUTION INTEGRATION

During the Solution Integration phase, the components of the solution, including processes, applications, network components, and data flow, are engineered and readied for deployment. All network, regional, and premise components are delivered, and the equipment rooms and other facilities are readied. Coordination with wireline, wireless, and VoIP telephone service providers is an essential part of this stage to plan for the 9-1-1 services management transition. Telephone service providers receive all necessary information and detail to obtain connectivity to the Intrado systems and the service provider's connectivity to the LNGs is engineered and ordered.

Working closely with the Customer and stakeholder groups, the project team designs customized provisioning plans (including incoming trunk route plans, bridge lists, and dialing plans). Additionally, the documentation and training developers customize the user and process documents and various training courseware, if needed, to meet the needs of the Customer.

11.5 SOLUTION DEPLOYMENT

During the Solution Deployment phase, all network components and equipment connectivity is confirmed. Validation and acceptance tests are performed, metrics tracking, reporting is initiated, and training is provided. After complete non-live call testing, the system begins supporting live 9-1-1 traffic.

In preparation for deployment and in partnership with the Customer's project team, the Intrado Program Manager (SPOC) finalizes the cutover plan, including procedures for notification concerning schedule specifics. In most cases, ALI services are converted prior to re-homing any telephone service provider end offices. As end office 9-1-1 traffic is cut over, existing 9-1-1 Service Provider legacy CAMA trunks are replaced by A9-1-1 Routing traffic.

Prior to the commencement of cutover, the project team members will hold a cutover meeting with the Customer and the telephone service providers. The purpose of this meeting is to discuss the progress of activities, the cutover readiness.

PSAP training is provided in accordance with the detailed training rollout plans. The system will then undergo a system acceptance test and quality walkthrough. Once complete, and in agreement with the Customer, a go/no go determination will be made and live-traffic cutover will then commence. Once live traffic has moved to the system, the maintenance period begins.

11.6 SOLUTION MAINTENANCE

The Solution Maintenance phase begins once live traffic is transferred onto any part of the system. During this phase, Intrado provides ongoing tiered support services to monitor service level performance, manage help desk requests and trouble tickets, escalate support procedures, and support the Customer to reach the highest level of operational excellence. The solution support team is in place to receive, analyze, and rectify problems and information requests.

The Intrado Project Management methodology is highly influenced by the Project Management Body of Knowledge published by the Project Management Institute. All of the above sections are part of the overall plan or part of the project charter used in projects of this scope.

11.7 MIGRATION PREPARATION

Intrado will work with the Customer to gather and confirm information to support the final network design and data provisioning efforts. A9-1-1 Routing provisioning will include the following data elements:

- PSAP Trunks
- Numbering Plan Digit ("NPD") assignment (if appropriate)
- Trunk assignments by call type (wireline, wireless, VoIP, or any combination)
- Route Lists/Routing Rules:
  - Primary and alternate routes
  - Star code destinations for first responders, PD, Fire, and EMS

  - Fixed bridge lists and star code assignments
  - PSAP Abandonment routing rules
- Intrado will work cooperatively with each TSP to gather and confirm information necessary to support data provisioning and trunking from the end office to the Intrado system, including the following data:
- Incoming signal type
- Call type
- Implied NPA, if applicable

As TSP migrations complete, Intrado will notify each TSP that their connectivity between their end office and the legacy SR is no longer required.

Intrado will manage a coordinated and secure staged implementation approach that minimizes risk because each stage is planned, implemented, and tested sequentially and independently for functional and operational efficiencies. The implementation project will be managed by an Intrado Project Manager via a formal Implementation Project Plan.

Once the implementation process is complete, calls route through the Intrado A9-1-1 Routing complex, eliminating the need for the existing selective routers, other than any potential services the S/Rs provide with agencies outside the State.

11.8 TESTING OF THE A9-1-1 ROUTING SOLUTION

Intrado will provide the PSAP a list of standard acceptance tests to demonstrate feature functionality of A9-1-1 Routing Services including:

- Correct routing of various call types
- Call hand-offs, transfers and bridging functions
- Operation of the system core and the provisioning elements
- Operation of the Intrado PSAP routers
- Configuration of network elements
- Selective routing
- Trunk only routing
- PSAP abandonment routing
- Alternate routing
- Default routing
- PSAP trunk group management by call type

Intrado will work collaboratively with PSAP personnel to modify this test plan to meet the needs of the PSAP. This may include the addition or removal of test cases as needed or desired. Once the test plan is completed and agreed upon, Intrado will work with the Customer to determine the test protocol specifics such as order of calls. Intrado will work with the Customer to schedule the testing, as appropriate.

Intrado manages the testing process and coordinates all test calls documented in the test plan. This testing is scheduled in accordance with the PSAP's availability. The PSAP is required to provide a resource to answer the test calls and provide documentation, such as screen prints and recordings, for certain calls.

Call tests are generally performed three times, proving the network connectivity is established and voice is delivered and received. Call completion as expected is the acceptance criteria unless otherwise negotiated.

Live traffic cut-over to Intrado A9-1-1 Routing services will be accomplished on an end office by end office basis. As connectivity is established and tested between the end office and the LNGs, Intrado will work with the TSP to conduct pre-migration tests prior to cutover to the LNGs. Once non-live testing has been completed for all EOs, the actual rehome of all EOs will be conducted. Intrado recommends that the live traffic rehomes be scheduled over a period of 24 to 48 hours (depending on the number of EOs to be

rehomed) and will work with TSPs and the State to facilitate the rehome in a manner which limits impact to the PSAP and TSPs.

Normal test and cut-over times will be during Customer's off-peak daytime "business hours." Test and cutover times outside of the normal business hours will be mutually agreed upon by the Customer and Intrado.

Upon receipt of the Letter of Agency, Intrado will be the primary point of contact for working with the TSPs to develop a migration plan for each end office. In the event that a TSP is uncooperative, Intrado will escalate to the Customer for assistance.

11.9 A9-1-1 ROUTING

A9-1-1 Routing features the following:

- A9-1-1 Routing is a specialized managed network for processing 9-1-1 calls from both traditional and non-traditional voice networks.
- A9-1-1 Routing provides selective routing functionality via an IP-enabled network and SIP interface.
- A9-1-1 Routing delivers 9-1-1 calls from end offices, central offices, mobile switching centers, and VoIP systems to a designated PSAP over redundant, private, IP, highly available MPLS T1 circuits.
- The A9-1-1 Routing service also supports PSAP queuing, PSAP overflow, call transfer, PSAP call origination, and virtual trunk group segregation for different call types.
- A9-1-1 Routing is a robust and highly available routing service that will provide the Customer the ability to configure call routing to dynamically meet its needs. Routing can be managed in real time to meet normal, overflow, and disaster situations.
- A9-1-1 Routing provides the familiar call routing configurations of selective routing, alternate routing, trunk-based routing, default routing, and PSAP abandonment routing.

11.10 A9-1-1 LOCATION DATA MANAGEMENT

A9-1-1 Location Data Management is a complete set of services that provides for comprehensive location validation and error correction, telephone service provider coordination, Service Order Input (SOI) management, and delivery of accurate data for 9-1-1 call support. The services include full standards-based support of all call types including wireline, wireless, and VoIP calls. Intrado will work with the Customer and PSAPs to transition from the PSAP's legacy ALI system to full i3 implementation with GIS-based location validation and other i3 functions and protocols for routing and delivery. The services include:

- Database setup, data preparation, and loading of subscriber records and location validation data
- Service order processing and error resolution
- Management of the existing subscriber database and migration to LIS, CIDB management
- Management of the location validation data and functions
- Customer data management tools
- Subscriber database systems residing at geographically diverse Intrado locations
- Next Gen 9-1-1 system monitoring
- Highly secure system access
- Wireline, wireless, and VoIP call support

11.11 A9-1-1 GIS DATA MANAGEMENT

A9-1-1 GIS Data Management offers a comprehensive and methodical approach to GIS data management that includes flexible procedures individualized to each authority. The overall goal is to create and maintain the authoritative GIS database for 9-1-1 purposes.

GIS data, as provided by the State/PSAPs, is critical within the NENA i3 reference architecture. This data will be used to provision the LVF, ECRF, and PSAP map displays.
The GIS data management offer includes an agreed upon mechanism for data sharing, reporting, and other GIS project management tasks: The State may choose to:

- Maintain their own GIS data through their existing tools and submits to Intrado for validation and provisioning
- Utilize the Intrado A9-1-1 GIS Data Management package in order for them to maintain their own GIS data, which includes:
    - MapSAG 9-1-1 GIS Data Management System software
    - Training of Agency personnel
    - GIS data collection

11.12 A9-1-1 TXT29-1-1®

One of the first i3 services to be implemented will be the Intrado TXT29-1-1 service which uses the three-digit short code "9-1-1" to enable citizens to text for assistance to a PSAP using regular SMS messaging. The text message is routed to the PSAP based on the location of the receiving wireless provider antenna face, unless an x-y coordinate is sent by the wireless provider, then location is based on the x-y coordinates. The service is managed through the Text Control Gateway, a highly available and high throughput platform that:

- Undertakes PSAP routing of text messages
- Establishes connections to multiple concurrent PSAPs and the ECRC for overflow routing
- Establishes a SIP dialogue with the CPE equipment for the duration of the dialogue until the agent terminates the connection. The SIP dialogue will evolve to an i3 compliant interface once ratified by NENA.
- Converts SMS messages incoming from the wireless carrier/SMS aggregator to the SIP dialogue
- Collects and makes available a transcript of all caller/PSAP interactions

11.13 A9-1-1 CAD Integration

Intrado will manage coordination with the PSAP's CAD vendor to enable delivery of A9-1-1 Enhanced Data services via the CAD system. The CAD Integration program includes:

- Delivery of the ESMI Partner Guide
- A9-1-1 Data ESMI Network Simulator
- A9-1-1 Data Service Pack/Service that will include the Service Specification and Service Simulator
- Time in the Intrado ESMI Certification lab to validate services end-to-end

Intrado will provide engineering support services throughout the development and testing processes.

11.14 PSAP Abandonment Device

The Intrado Abandonment Module (Acronym "PAD") is a device that is installed by CenturyLink at the PSAP premise. The PAD is a device that allows a 9-1-1 call re-route communication message to be sent to the Intrado Advanced 9-1-1 (A9-1-1) network in the event a PSAP is abandoned or is considered out of service. CenturyLink will provide the (1) PAD for each PSAP as part of this proposal. An Intrado data sheet is included as attachment for review.

12.0 NEXT GEN 9-1-1 IP Network Design

12.1 Reference Drawing

Please reference file ***AZ NG9-1-1 Design***

12.2 LNG Locations

CENTURYLINK and Intrado will place two LNGs in Arizona at the following data centers:

- Tucson – Involta Data Center 1215 E Pennsylvania St, Tucson AZ 85714
- Phoenix – IOData Data Center 615 N 48th St, Phoenix AZ 85008

12.3 ECMC Locations

Intrado's ECMCs are located at the following two locations:

- 393 Inverness Pkwy, Englewood CO 80112

- 50 NE 9th St, Miami FL 33132

12.4 VIPER HOST LOCATIONS

VIPER Hosts will be installed in the two existing ECMC locations in Englewood CO and Miami FL.

- 393 Inverness Pkwy, Englewood CO 80112
- 50 NE 9th St, Miami FL 33132

12.5 VESTA HOST LOCATIONS

CENTURYLINK will install VESTA Hosts in the following two data centers:

- IOData Data Center – 615 N 48th St, Phoenix AZ 85714
- CENTURYLINK Data Center - 9110 Commerce Center Cir, Highlands Ranch CO 80129

12.6 LNG TO ECMC IP NETWORK DESIGN

CENTURYLINK will provide dual 1Gig diverse IP connectivity via the CENTURYLINK provided IQ MPLS Private Port from the LNG to the ECMC. Each 1Gig loop over fiber will hone to a diverse CENTURYLINK POPs.

Based on bandwidth requirement of 75mb these links will have less than 10% utilization and leaves significant capacity for growth.

12.6.1 Bandwidth Requirements

LNG to ECMC bandwidth is determined by the following formula:

(Number of 9-1-1 SR Trunks) x (144kb)

Based on the 9-1-1 trunk count for Arizona, the required bandwidth from the ECMC to the LNG is

- Cassidian = 255 or (255 x 144kb = **36,720kb**)
- Intrado = 262 or (262 x 144kb = **37,728kb**)

Total required bandwidth is 36,720kb + 37,728kb = 74,448kb or **75mb**

12.6.2 Network Protocols

CENTURYLINK will run layer 2 and layer 3 protocols that will provide fast convergence in event a link should fail. This will include layer 2 SLA and layer 3 BGP on the outward facing interfaces at the LNG and ECMC and layer 3 VRRP or HSRP on the inward facing interfaces.

12.6.3 Edge Devices

Each 1Gig loop will terminate on diverse edge routers/switches at both the LNG and ECMC.

12.7 ECMC TO HOST CPE SYSTEMS

12.7.1 Intrado VIPER

Geo Diverse VIPER Hosts will be installed at the ECMCs. As such, the network connecting the ECMC to VIPER Hosts will be local and will not require an IQ MPLS Private Port. Connectivity between the two VIPER Nodes is over the existing Intrado cloud connecting the two ECMCs.

12.7.2 Cassidian VESTA

For ECMC to VESTA Hosts, CENTURYLINK will be providing dual 1Gig diverse IP connectivity via a CENTURYLINK provided IQ MPLS Private Port. Each 1Gig loop over fiber will hone to diverse CENTURYLINK POPs. As calculated below ECMC to VESTA Hosts require 37mb bandwidth. Each 1Gig loop will have less than 5% utilization and provides significant capacity for growth as required.

12.7.3 Bandwidth Requirements

ECMC to Host Sites is determined by the following formula:

(Number of 9-1-1 SR Trunks) x (144kb)

Based on the 9-1-1trunk count for Arizona, the required bandwidth from ECMC to VESTA Hosts is

- Cassidian = (255 x 144kb = **36,720kb)**
- Intrado = (262 x 144kb = **37,728kb).** As this traffic will stay local within the ECMC or traverse the Intrado cloud, CENTURYLINK IQ Private Ports are not required for this connectivity.

12.7.4 Network Protocols

CENTURYLINK will run layer 2 and layer 3 protocols that will provide fast convergence in event a link should fail. This may include layer 2 SLA and layer 3 BGP on the outward facing interfaces at the ECMC and Hosts and layer 3 VRRP or HSRP on the inward facing interfaces.

12.7.5 Edge Devices

Each 1Gig loop will terminate on diverse edge routers/switches at both the ECMC and VESTA Hosts. VIPER hosts will terminate on diverse routers and switches within the ECMC.

12.8 HOST CPE TO REMOTE PSAP CPE

12.8.1 Intrado VIPER Host Sites to Remote Sites

CENTURYLINK will provide dual 1Gig diverse IP connectivity via the CENTURYLINK provided IQ MPLS Private Port from the VIPER Hosts at the ECMC to the CENTURYLINK MPLS cloud. Each 1Gig loop over fiber will hone to a diverse CENTURYLINK POPs. Based on calculated required bandwidth below of 80mb, each 1Gig link will have less the 10% utilization.

CENTURYLINK will provide dual IQ MPLS Private Port loops to each VIPER remote PSAP. Each loop will hone to diverse CENTURYLINK POPs. Bandwidth will vary depending on position count of each PSAP. Most loops to the IQ MPLS network will be over DS1 or bounded DS1s (NxDS1). For sites requiring greater than 10.5mb of bandwidth, the local loop may be Ethernet over copper or Ethernet over fiber.

Approximately 50% of VIPER 9-1-1 positions will be primarily homed to Node A and 50% to Node B. If one of the VIPER nodes fails, then 100% of the VIPER system's traffic will be served by the alternate surviving node.

12.8.2 Bandwidth Requirements

Bandwidth requirements to each remote PSAP are estimated by the following formula:

Per PSAP Bandwidth = 1000kb + ((Position Count) x (100kb)

Bandwidth requirements for each VIPER host are estimated by the following formula:

Host Bandwidth = Sum of PSAP Bandwidth Required

Based on the total PSAP Count and VIPER Position Count for Arizona, the required bandwidth is

PSAPs = 42

Positions = 375

(1000kb x 42) + (375 x 100) = 79,500kb or **80mb**

CENTURYLINK and Intrado will determine the exact required bandwidth for each PSAP after site survey and call flow meeting has been conducted. Remote PSAP bandwidth above is only for estimating Host bandwidth requirements. CENTURYLINK's Managed Services Solution will provide the required bandwidth to each PSAP to deliver 9-1-1 calls, GIS updates, access to MIS databases, remote monitoring / response, and remote access.

12.9 CASSIDIAN VESTA HOST SITES TO REMOTE SITES

CENTURYLINK will provide dual 1Gig diverse IP connectivity via the CENTURYLINK provided IQ MPLS Private Port from VESTA Host sites to the CENTURYLINK MPLS cloud. Each 1Gig loop over fiber will hone to a diverse CENTURYLINK POPs. Based on calculated required bandwidth below of 70mb, each 1Gig link will have less the 10% utilization.

VESTA Hosts with Split Core as will be deployed for Arizona, require a layer 2 connection between each core. This bandwidth must be equal to the sum of required bandwidth of the host system or 140mb. CENTURYLINK will provide a 1Gig layer 2 fiber connection between the two VESTA cores. CENTURYLINK will provide dual IQ MPLS Private Port loops to each VESTA remote PSAP. Each loop will hone to diverse CENTURYLINK POPs. Bandwidth will vary depending on position count of each PSAP. Most loops to the IQ MPLS network will be over DS1 or bounded DS1s (NxDS1). For sites requiring greater than 10.5mb of bandwidth, the local loop may be Ethernet over copper or Ethernet over fiber.

VESTA Core A is the Active Core while Core B runs in standby mode. A layer 2 network provides network connectivity between the two cores. If a failure occurs at Core A, then 100% of the VESTA system's traffic will be managed by Core B.

12.9.1 Bandwidth Requirements

Bandwidth Requirements to each remote PSAP are estimated
Per PSAP Bandwidth = 1000kb + ((Position Count) x (100kb)
Bandwidth requirements for each VESTA host are estimated by the following formula:

Host Bandwidth = Sum of PSAP Bandwidth Required

Based on the total PSAP Count and VESTA Position Count for Arizona, the required bandwidth is

PSAPs = 37
Positions = 241
(1000kb x 37) + (241 x 100) = 61,100kb or **70mb**

CENTURYLINK and Cassidian will determine the exact required bandwidth for each PSAP after site survey and call flow meeting has been conducted. Remote PSAP bandwidth above is only for estimating Host bandwidth requirements. . CENTURYLINK's Managed Services Solution will provide the required bandwidth to each PSAP to deliver 9-1-1 calls, GIS updates, access to MIS databases, remote monitoring / response, and remote access.

12.9.2 Network Protocols

CENTURYLINK will run layer 2 and layer 3 protocols that will provide fast convergence in event a link should fail. This may include layer 2 SLA and layer 3 BGP on the outward facing interfaces at the Host and remote sites and layer 3 VRRP or HSRP on the inward facing interfaces.

12.9.3 Edge Devices

Each 1Gig loop will terminate on diverse edge routers/switches at both the Host sites and Remote sites.

12.10 SR 9-1-1 TRUNKS FROM LSR TO LNG

- There will be two LNGs for Arizona, Phoenix and Tucson
- LNG will be located in data centers
- As PSAP is migrated to NG9-1-1, EM trunks between LSR and PSAP are migrated to SR trunks between LSR and LNG
- CENTURYLINK's design is a ratio of 1.3 SR trunks for every EM trunks. May be adjusted as monitoring dictates to ensure a P.01 grade of service

12.10.1 P.01 Grade of Service

P.01 Grade of Service is the responsibility of each telephone carrier. CENTURYLINK is only responsible for ensuring that it meets a P.01 service level for 9-1-1 traffic over its 9-1-1 trunks. To ensure a P.01 service level, CENTURYLINK will:

- Run a report within 30 days after migrating a PSAP over to the NG9-1-1 network
- Run a report every quarter on all PSAPs that have migrated over to the NG9-1-1 network
- Provide copies of these reports to the PSAPs
- Provide these reports at no additional charge to the customer.

12.11 ECMC CONNECTIVITY – REFER TO ATTACHED DRAWING "AZ NG9-1-1 DESIGN"

- Two ECMC located in Miami FL and Englewood CO
- Each LNG honed to both ECMCs (VPN A and VPN B) through diverse POPs
- Estimated required bandwidth for VPN A and VPN B is 75mb
- Calls routed through LNG to ECMC (VPN A & B) and then from ECMC to Host (VPN C & D)
- All network edge devices are monitored
- 1Gig Connectivity from ECMC to LNG and ECMC to Hosts

12.12 HOST VIPER TO ECMC AND HOST VIPER TO REMOTE PSAP VIPER CONNECTIVITY – REFER TO attached drawing "***AZ NG9-1-1 Design"***

- VIPER Hosts are located in the Intrado ECMC in Miami FL and Englewood CO
- VPN C & D are local – IPSR to VIPER Host
- VPN G & H are for Host / Remote connectivity
- Each VIPER remote is honed to both VIPER Host
- Each VIPER Host is honed to diverse POPs
- Required bandwidth for each VIPER remote varies by position count. Most remote sites will use a bonded DS1 (NxDS1) local loop
- VIPER Host bandwidth is estimated at 80Mb
- Bandwidth from VIPER host to MPLS cloud will be 1Gig

12.13 HOST VESTA TO ECMC AND HOST VESTA TO REMOTE VESTA PSAP - REFER TO ATTACHED DRAWING "*AZ NG9-1-1 Design"*

- VPN C & D is connectivity between IPSR and Host VESTA
- VPN C & D required bandwidth is 37mb. Actual connectivity will be 1Gig
- VESTA Hosts are honed to each ECMC through diverse POPs
- VESTA Hosts will be installed in two data centers with one in Phoenix AZ and the other in Highlands Ranch CO
- Highlands Ranch data center is same building and location as the CENTURYLINK POP
- VPN E & F is connectivity between VESTA Host and VESTA Remotes
- VPN E & F required bandwidth is 70mb. Actual bandwidth is 1G
- VESTA Remotes bandwidth will vary depending on position count
- VESTA Remotes connectivity will mostly be by bounded DS1 (NxDS1)
- Redundant 1Gig Layer 2 connectivity between VESTA Core A and VESTA Core B
- All network edge devices are monitored

13.0 CPE MANAGED SERVICE

13.1 SOLUTION SUMMARY

CENTURYLINK's managed service solution is a Host / Remote architecture. Current deployments are using NG9-1-1 systems from Intrado (VIPER) and Cassidian (VESTA 4.x). The solution includes the following applications:

- NG9-1-1 Call Taking Systems
  - Cassidian VESTA 4.x
  - Intrado VIPER
- MIS Applications
  - Intrado Power MIS
  - Cassidian Aurora MIS
- GIS Mapping Applications
  - Intrado Map Flex
  - Cassidian Vela
- GIS Updating Applications
  - Intrado Map Flex
  - Cassidian Data Sync
- Services
  - Remote Monitoring and Response
  - Anti-Virus
  - Patch Management
  - Software Upgrades
  - Proactive Hardware Maintenance

CENTURYLINK will deploy its Managed NG9-1-1 CPE solution in a single Geo Diverse Host / Remote configuration for each 9-1-1 CPE Manufacturer. Each host location will be served by redundant and diverse MPLS circuits. Each remote site will be served by a pair of redundant MPLS circuits

NG9-1-1 calls will be delivered over the Arizona ESInet to host locations, where the specific 9-1-1 call handling equipment will route to the appropriate PSAP over a separate private IQ MPLS Private Port VLAN. Each manufacturer's NG9-1-1 host system will have a redundant pair of call processing servers and ALI controllers, or cores. These cores (Core A & Core B) will be deployed in a geo diverse configuration in the follow data centers.

VIPER Nodes:

VIPER Hosts will be located in existing Intrado ECMCs at locations below

- 50 N 9th St, Miami FL – NAP of the Americas Data Center
- 393 Inverness Pkwy, Englewood CO – LATISYS Data Center

VESTA Cores

New VESTA hosts will be installed at following locations:

- 615 N 48th St, Phoenix AZ – IOData Data Center (For CENTURYLINK and CENTURYLINK customer's only)
- 9110 Commerce Center Cir, Highlands Ranch CO – CENTURYLINK Data Center

13.2 EXAMPLES OF HOST REMOTE SYSTEMS

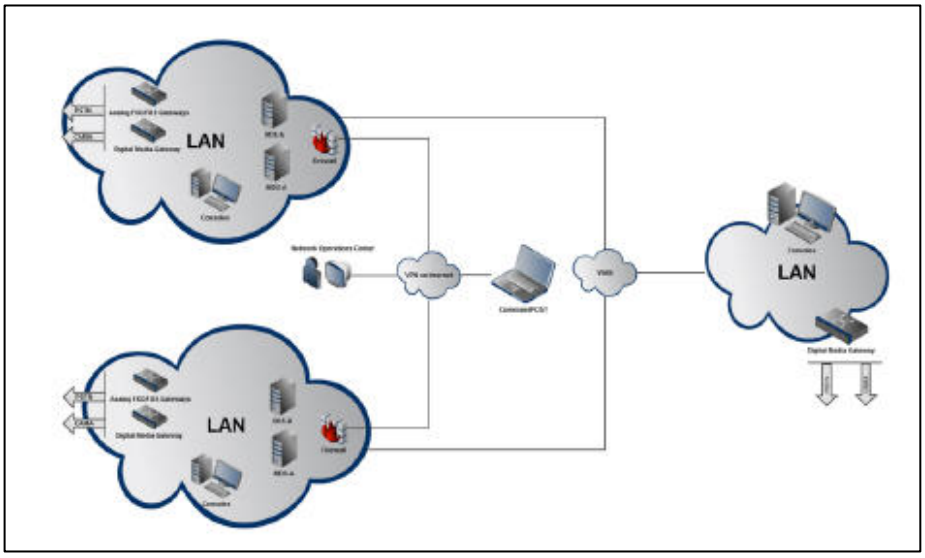


Figure 13.1 – VESTA in a Distributed GEO Diverse Configuration

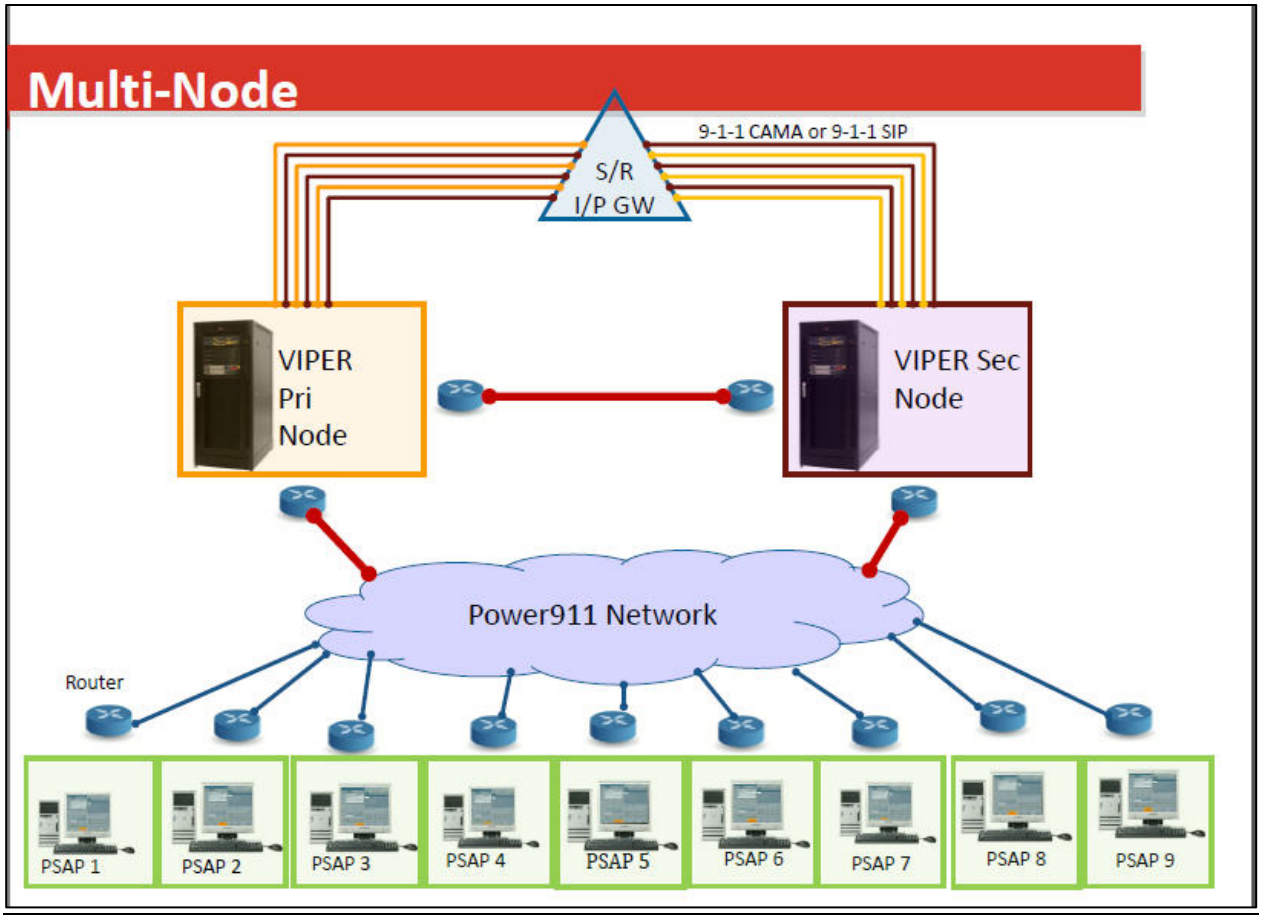


Figure 13.2 – VIPER GEO Diverse Multi-Node Host Remote

13.3 SYSTEM HOSTS

CENTURYLINK's solution includes the required space and facilities to support the host systems. For each CPE system manufacturer, CenturyLink shall provide:

- Co-Location Space for host system components
- All racks and power requirements
- NG9-1-1 Core Components - Call Processing Servers, ALI Controllers, and system configuration databases at each host location
- MIS Servers – Single Deployment
  - Single Power MIS server at one of the two host sites
  - Single Aurora MIS server at one of the two host sites
- GIS Host Servers – Single Deployment
  - Single GIS Central Server at one of the two host sites
  - Single DataSync server at one of the two host sites
- Network Management Server
- Master Time Clock – Each host system
- Peripherals – KVM and monitors
- Backup Devices
- LAN switches
- Routers
- Patch Panels
- All cabling

13.4 REMOTE PSAPS

CENTURYLINK will provide the following as ordered by individual PSAP:

- NG9-1-1 Call Taking equipment, including Gateways (FXO, FXS, and T1)
- GIS Mapping applications
- MIS Applications
- Remote Monitoring and Response
- Anti-Virus
- Firewall

13.5 PSAP EQUIPMENT

A sample of equipment to be installed is provided as a representative list only. The actual equipment requirement will vary PSAP to PSAP.

13.5.1 Backroom Equipment

- Racks
- UPS
- Gateways – FXS, FXO, and Digital ISDN T1
- LAN switches
- Serial Ports for serial hand offs (Example: CAD and DLR)
- Patch Panels
- Patch Cables
- Application servers (Example: GIS server for map updates)
- Monitors
- KVM
- CDR outputs to customer CAD and Recorders

13.5.2 Front Room Equipment

- NG9-1-1 Call taking Workstation, includes:
    - Keyboard & Mouse
    - Monitor for call taking GUI (19” or 22” LCD)
    - Monitor for mapping GUI (19” or 22” LCD)
    - Audio Control Box
    - 2 Headset Jacks
    - 2 Port KVM (Arbitrator)
    - Genovation Keypad
    - Extension cables
- Network Printer (1)
- Position UPS and Power Strips

13.6 CABLING

If required, CENTURYLINK will install four (4) CAT6 drops to each 9-1-1 call taking position to 9-1-1 CPE equipment in back room. These four drops will be for exclusive use by CENTURYLINK for the 9-1-1 CPE equipment being provided to the PSAP by CENTURYLINK. The following will be included;

- (4) CAT 6 drops
    - (2) for 9-1-1 position CPU
    - (1) for audio to customer provided recording equipment
    - (1) spare
- (1) CAT 6 drop for network printer
- Cables from 9-1-1 CPE equipment to IQ MPLS Private Port Equipment
- CAT 3, 5, or 6 cables from 9-1-1 CPE equipment in backroom to IDF backboard in backroom
- Cabling will include all required jacks, patch panels, and patch cables

13.7 ADMIN LINES
CENTURYLINK will provide PSAPs with Analog or Digital gateways for connecting analog administrative or ringdown lines, PSTN ISDN PRI lines, and tie lines to PSAPs PBX. PBX must support PRI ISDN / QSIG signaling.

13.8 CDR OUTPUTS
CENTURYLINK will provide CDR outputs to customers' CAD and Recording equipment. These outputs will terminate on or within 20 feet of CENTURYLINK's backroom equipment at PSAP

13.9 HEADSET INTEGRATION
CENTURYLINK will provide optional headset integration depending on PSAP requirement. CENTURYLINK D-mark is at the Audio Control Box. CENTURYLINK will work with PSAP radio maintenance provider for connectivity and testing.

13.10 LOGGING RECORDER
CENTURYLINK will provide an analog voice handoff to PSAPs logging recorder from the workstation audio control box. This handoff is from an 8 PIN plug, 7 feet long, off of the audio control box.

CENTURYLINK will work with PSAP's logging recorder vendor assuring audio is being sent to recorder. VOX or Contact Closure can be configured depending on each PSAPs requirement.

ANI can be sent for CDR to logging recorder if required by PSAP. CENTURYLINK will hand this CDR output off to PSAP in the 9-1-1 CPE equipment rack. PSAP would be responsible for extending to their recording equipment.

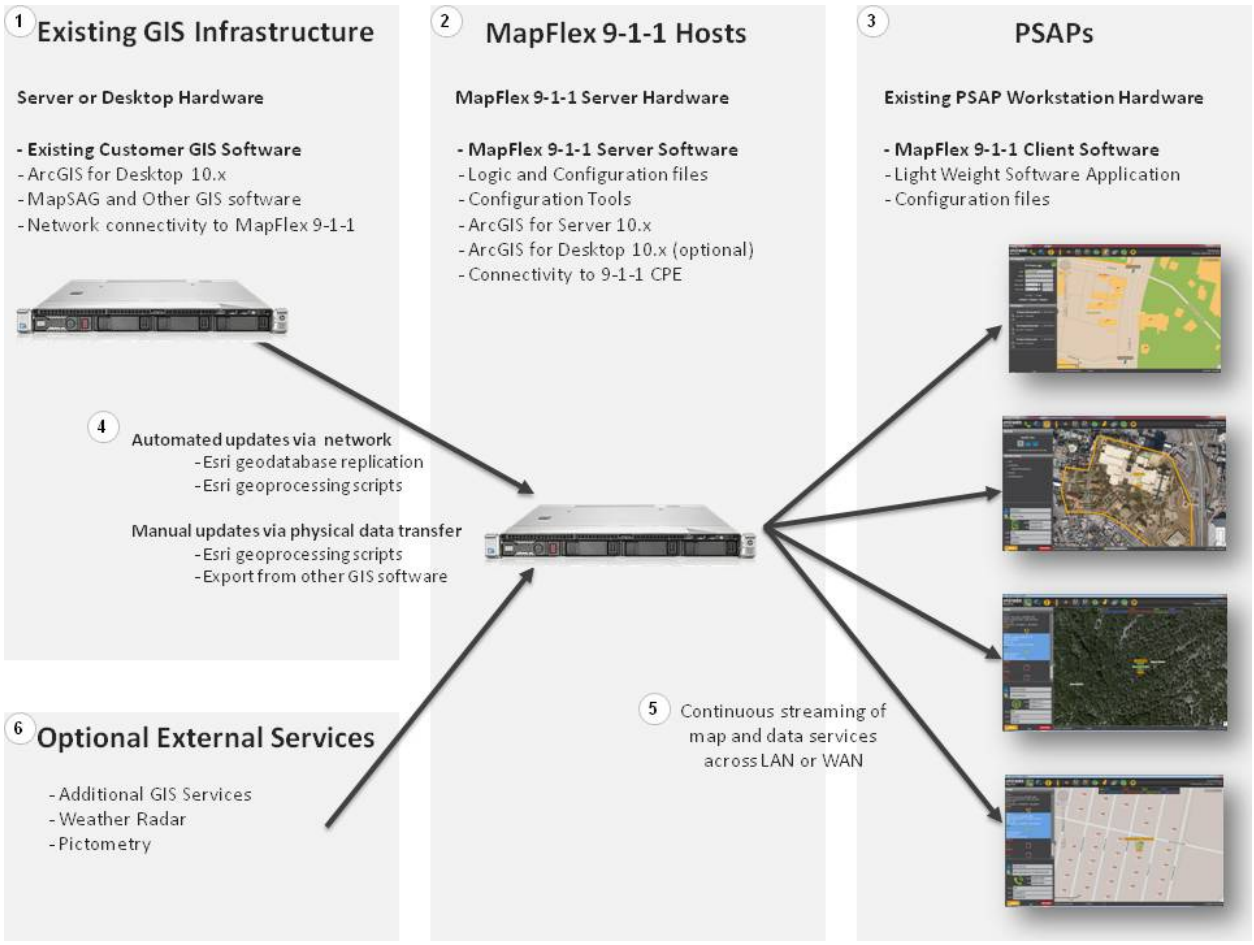
13.11 TEXT MESSAGING AND TEXT MESSAGING SERVICES
While the CENTURYLINK NG9-1-1 solution will support Text Messaging Services, the service offering is not part of the solution scope. Optional pricing will be provided to the PSAPs if they wish to implement the text messaging services.

13.12 TEXT MESSAGING CPE INTERFACES
Both proposed CPE products, Intrado's VIPER and Cassidian's VESTA provide an integrated text messaging interface. This interface is included in the CENTURYLINK solution.

13.13 EXAMPLES OF EQUIPMENT NOT INCLUDED AT REMOTE PSAP SITES
- Master Time Clock – Only required at host sites.
- Electrical Power
- Additional administrative workstations (Example: For MIS reporting)
- Reader boards
- Firewalls – Connectivity between PSAP LAN and local agency LAN
- Headsets
- Additional printers

14.0 LOCAL GIS DATA MANAGEMENT
GIS Data Management will be a responsibility of the PSAP customer. A Centralized solution will be provided for updating Maps over the specific NG9-1-1 CPE vendors host / remote network. Below are vendor specific responses.

14.1 INTRADO
The MapFlex 9-1-1 architecture and data update process is described in the diagram and numbered, associated text below.



1

Existing GIS Infrastructure

- MapFlex 9-1-1 utilizes your agency's existing GIS infrastructure to enable the use of your accurate and complete local GIS data.
- MapFlex 9-1-1 can seamlessly consume data from Esri ArcGIS 10.x or from other GIS software that is capable of exporting data in an Esri compatible format.
- Network connectivity to the MapFlex 9-1-1 Host Server enables automated, near real time GIS data updates.

2

MapFlex 9-1-1 Hosts

- A dedicated MapFlex 9-1-1 Server(s) is the core of the MapFlex 9-1-1 solution.
- MapFlex 9-1-1 Server(s) Software is based on ArcGIS for Server 10.x.
- All map and data configuration files are stored on this centralized server to enable fast and easy updates.
- Connects to your existing 9-1-1 system to geocode 9-1-1 calls and events.

3 *PSAPs*

- Lightweight MapFlex 9-1-1 Client Software is installed on existing PSAP workstation hardware to consume the MapFlex 9-1-1 application and data from the MapFlex 9-1-1 Server.

4 *Data Updates*

- Automated updates can be enabled via network connectivity between GIS server/desktop and MapFlex 9-1-1 server(s)
- Manual updates are also available via data extract and physical data transfer if no network connectivity exists.

5 *Data Streaming*

- When the MapFlex 9-1-1 Server(s) is updated with new GIS data the PSAP telecommunicators instantly see the new updates without having to restart their systems.

6 *Optional External Services*

- MapFlex 9-1-1 can optionally consume data services such as weather radar using existing internet connectivity.

For PSAPs that are not utilizing MapFlex 9-1-1, Intrado will provide services to update other mapping products' local servers. These services will utilize a similar workflow as the SIF. Intrado will work with each mapping provider to understand the data requirements for each application. Finally, Intrado will export data to each mapping provider's designated location at each PSAP in the required Esri data format and database schema. This data update process can be performed using a mix of Geodatabase replication, custom scripting or manual update processes over the network, where connectivity to the CENTURYLINK network exists, or manual updates via data extract and physical data transfer if no network connectivity exists, as required with each provider. Intrado performs a similar service today with several providers for the entire State of New Mexico.

Intrado's 9-1-1 SIF System is a managed service that encompasses an interface with multiple agencies to obtain locally maintained GIS data, perform error detection, normalize the data, transforming it into a common data schema, performing basic validations, reporting on gaps/overlaps that exceed a configurable threshold and provisioning to Next Generation 9-1-1 (NextGen 9-1-1) systems including Emergency Call Routing Function (ECRF), Location Validation Function (LVF) and MapFlex.

14.1.1 Data Requirements

The Intrado SIF is designed to work with most customer provided GIS data. The GIS data accepted includes Esri formats personal Geodatabase, file Geodatabase, or shapefile. 9-1-1EGDMS utilizes a NENA NG9-1-1 GIS Data Model V1 compliant design, and the 9-1-1EGDMS system will help customer data comply with these standards and guide them to meet the minimum data requirements. There may be cases where minor alterations of the customer data are required. Intrado GIS Analysts will review the GIS data format and recommend any necessary changes.
The feature classes supported by Intrado's SIF include:

- Street Centerlines - Street centerline data for the agency's jurisdiction with optional street name alias tables.
- Fire Response Boundary - Fire response boundary polygons for the agency's jurisdiction.
- Address/Structure Location - Address/structure points for the agency's jurisdiction.
- Law Response Boundary - Law response boundary polygons for the agency's jurisdiction.

- PSAP Area Boundary - Public Safety Answering Point boundary polygons for the agency's jurisdiction.
- EMS Response Boundary - EMS/medical response boundary polygons for the agency's jurisdiction.
- Emergency Service Zone - Service response boundary (ESN boundary) polygons that include Fire, Law, and EMS response agencies in the jurisdiction.
- Municipal Boundary - Municipal boundary polygon(s) for the agency's jurisdiction.
- Authoritative Boundary - Authoritative boundary polygon that covers the geographic region in which the agency has jurisdiction.

14.1.2 User Interface

The Intrado customer portal is a fully web-based solution that serves as Intrado's front end user interface for the National Emergency Number Association (NENA) Spatial Information Function (SIF) requirement. The portal provides secure GIS file transfer to Intrado and customers are able to maintain their local database schema and configure database changes on the fly. The portal provides:

- Secure File transfer via Intrado Unified Portal (IUP) with secure 2 factor authentication
- Popular file format support for File Geodatabase, Personal Geodatabase and Shapefile
- Automated schema change detection and error notification
- Attribute field mapping configuration driven by the customer
- Automated Email notifications for upload and processing status
- GIS Data Validation Report Retrieval

The web application allows customers to upload their GIS data, to capture and manage the metadata related to the contents of GIS uploads, to convey processing status of the uploaded data, and to access reports generated during processing and validation of those uploads. 9-1-1 GIS data is managed by our customers in different forms and by different entities at different levels of government. The county or other governmental agencies which are responsible for providing the spatial addressing information may have other data management responsibilities beyond 9-1-1, and as a result we expect most customer schemas to be unique and dynamic.

The key functionality of the portal is the schema configuration user interface (UI) and GIS data interrogator. The field mapping tools allows customer to configure their database field mappings and update them when necessary. Upon successful data transmission, an automated process extracts the data from its compressed (.zip) format and reads the contents of the database or shapefiles. The data interrogator automatically checks that the data contents are valid, in the correct format, with the required attribute fields as mapped and stored within the system's schema field mapping configuration template. Any discrepancy or schema change triggers automatic notification to the data provider, alerting them that action is required. In the event that the schema was changed and saved fields are missing or their properties have changed, the customer can make the necessary changes immediately. This allows each customer to maintain individual database schemas and make changes as necessary within the portal UI.

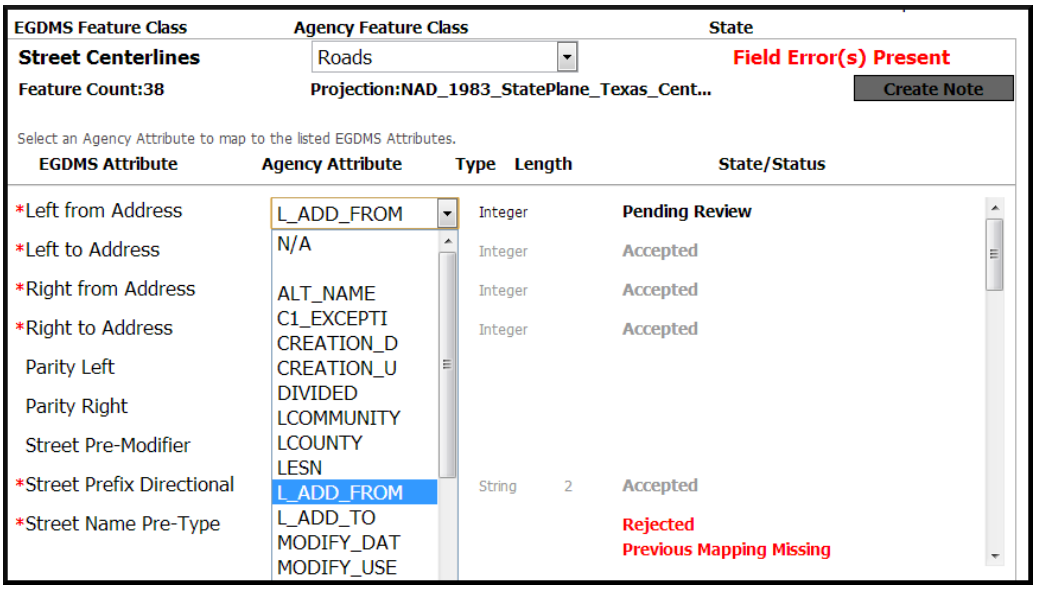
14.1.3 System Architecture

The Intrado web portal is the centerpiece of interaction between the various users of the system, and the server-side systems will store, process and distribute the incoming customer GIS data. Application web services will provide enhanced and automated processing capabilities on the customer GIS data, allowing for fast and large scale throughput. Enterprise GIS datastores will support QA/QC activities, and also serve as the SIF. The SIF will also interact with application web services to provision GIS data to i3 datastores including ECRF/LVF, MapFlex, and DataSync.

The architecture for the solution is based on leveraging a suite of commercial software tools which will provide the core system capabilities to store and manage GIS data, manage the processing workflows, and perform various geospatial extract, transform, load (ETL) roles. Automated processing tools include Esri ArcGIS for Server to provide enterprise GIS data storage and management, FME from Safe Software to provide geospatial ETL capabilities, and Workflow Manager from Esri, to manage the overall processing workflows, automation and processing job state management and reporting capabilities.

The Intrado solution involves proprietary delta detection tools that allow customers to submit full GIS databases as opposed to only added/changed/deleted features. As many GIS agencies do not possess the licensing requirements for Esri replication, and many do not maintain Unique IDs, the ability for all customers to isolate and submit only changed features is not reliable or easily achieved. Not only does this solution support any customer data (shapefile, Personal Geodatabase or File Geodatabase formats) it does not require additional licensing and does not require that the agency maintain UIDs. With incoming customer data separated into changed and unchanged sets, and the changes flagged as being geometry based, or attribute based, the Intrado solution will run both validation and coalescing operations on only the changed data alone, which will expedite the overall processing time and streamline the provisioning update processes.

The upload details screen allows user to configure the upload, and view an activity log for the selected upload.



The user can configure their schema field mappings, and correct any errors using the Field Mapping Tools. Schema validation includes automated data type and field length warnings/errors

14.2 CASSIDIAN ORION VELA

The Arizona 9-1-1 Program office, Local 9-1-1 System Administrator, or PSAP will maintain the ORION Vela map displays (Templates) for all PSAPs on their map administration workstation. They will publish these Templates and map data updates to the DataSync Center server. The DataSync Center server will synchronize Template and map data updates on a scheduled and/or instantaneous basis. PSAPs with more than six positions will require a DataSync Edge server to be located at the PSAP. DataSync clients on PSAP workstations will periodically check (default is 5 min) for available updates on their respective DataSync server. When an update is available, DataSync client will pull the update package down from its respective Edge or Center server in the background without interfering with active applications. When the update is downloaded and processed a notification appears to the call taker stating that an update is available. They may then restart the ORION Vela application at their leisure.

Map data updates may be passed to the Arizona 9-1-1 Program office, Local 9-1-1 System Administrator, or PSAP via mapped network drives to the DataSync Center server. Current regional map administrators may continue to maintain their map displays and would pass their Template updates with their map data updates.

Orion Vela can use the data from the SIF. This is done using the field names and file names of specific map data layers. Ultimately, the data must be provided in shapefile format.

15.0 IP RECORDING OF 9-1-1 CALLS

There are several options available for recording of the solution. The methodology chosen will depend on the PSAP's needs, CPE vendor capabilities and Logging Recorder capabilities.

The most common option in an ESInet environment is position based recording. The Intrado A9-1-1 VIPER proposal provides an analog output of position audio at the headset/handset jack level to include radio traffic if radio audio is provided to that jack by the PSAPs radio vendor. The Intrado solution is capable of headset arbitration of the telephone/radio traffic with the arbitration managed by the Intrado telephone, or managed by the radio provider. CenturyLink will work with the PSAPs to determine the operational architecture that works best for the PSAP, and the PSAP will need to engage their radio vendor for the appropriate radio connections.

Cassidian VESTA provides an analog output of position audio at the headset/handset jack level and is capable of headset arbitration of the telephone/radio traffic with the arbitration managed by the Cassidian sound device or managed by the radio provider. CenturyLink will work with the PSAPs to determine the operational architecture that works best for the PSAP, and the PSAP will need to engage their radio vendor for the appropriate radio connections.

NENA is in process of developing an i3 specification for Logging Recorders. Intrado will meet the NENA i3 build-to standard for a new IP logging recorder interface, as published at the time of deployment of said interface in Arizona PSAPs. Intrado participated in NENA ICE 8 to demonstrate this capability.

As an option, Intrado offers a cloud based logging recorder service for NG9-1-1 voice traffic in the Intrado cloud core call taking solution. This would capture voice traffic at each redundant Intrado data center, and provide for a browser based access through separate secure paths to recording management. Options are also available to provide for alternate IP networking for migration of the recording files to local storage devices for local, or consolidated access. The specific architecture and technology would depend on the Logging Recorder vendor selected.

15.1 INTRADO VIPER

From the CPE perspective, Intrado has available a 3rd Party IP Recorder Interface Kit providing for the following:

15.1.1 Physical IP packet-capture solution

This is the mechanism by which the VIPER SIP and RTP packets are securely shared with the 3rd party recorder at the VIPER switch level.

15.1.2 VIPER 3rd party recording license

This is the VIPER-side license that enables a 3rd party recorder to have a one way IP connection to VIPER.

15.1.2.1 Span port method

Two Small form-factor pluggable transceiver (SFP) modules are inserted into each VIPER LAN switch pair. There will be one SFP per switch. Each SFP module enables a gigabit SPAN IP output flow, which will feed either a primary or a secondary 3rd party recorder.

15.1.2.2 Passive Tap method

Passive taps are placed in the voice path between the VIPER VOIP servers and the VIPER LAN switches. The taps all feed an aggregator module which provides two output flows. These will feed both a primary and a secondary 3rd party recorder. One Tap Port Set (P10010) is needed per VIPER node from where tapping is to take place.

Please see the attached Product Bulletin for greater detail on the Third Party IP-Recording Kit

15.2 CASSIDIAN VESTA

For Cassidian System, IP recording can is done using the Span port method as described in section 15.1.2.1above.

15.3 CENTURYLINK IP CLOUD RECORDING SERVICE

As of July 2014, CENTURYLINK is engaged in developing a cloud recording solution for the hosted Cassidian VESTA.

15.4 IP RECORDING COSTS

IP Recording is not included with the current service offering. If IP recording is required at the PSAP or Host System level, additional charges would apply for equipment and labor.

16.0 CUSTOMER TRAINING

CENTURYLINK will provide the following training options to PSAPs. It is assumed all training will take place at customer location and customer will provide a facility appropriate for conducting training.

16.1 CASSIDIAN ADMIN TRAINING

CENTURYLINK will provide administrative training for Cassidian Systems for each PSAP as follows. Each class size is limited to 8 students.

- (1) VESTA Administrative class
    - Course Duration: 1 Day
- (1) Activity View Administration class
    - Course Duration: 4 Hours
- (1) DataSync Administration class
    - Course Duration: 1 Day

16.2 CASSIDIAN TRAIN-THE-TRAINER AGENT TRAINING

CENTURYLINK will provide (1) Agent Train the Trainer class to each new PSAP. Train-The-Trainer classes will cover all agent topics as well as tips to train the call takers specific to the PSAP. Class size is limited to 8 students and course duration is 1 day.

16.3 CASSIDIAN CUT-OVER COACHING

CENTURYLINK will provide a trainer on site on day of cut over to answer any questions and or assist call takers as they transition to the new system.

16.4 CASSIDIAN WEBINARS

Cassidian's training department will develop a value added free quarterly webinar based service to review what's new, answer questions, etc. Topics are TBD, but might include:

- Major System Changes
- New Features
- Important need to know information
- Etc

16.5 INTRADO ADMIN TRAINING

CENTURYLINK will provide one (1) on-site training session for End User administrators. This training is expected to last for two (2) full days (6 training hours per day). The End User may have up to eight employees attending the Intrado on-site training as long as the End User provides an adequate training facility and workstations/computers for number of attendees. In addition, one additional day of Administrator training is provided to support the cutover.

16.6 INTRADO AGENT TRAINING

Intrado will provide either end-user training or train the trainer training for the End User, as follows:

- Training the Trainer - one (1) on-site training session for up to eight End User Power 9-1-1 call takers/dispatchers with a maximum of 2 people per workstation. This training is expected to last for two (2) full days (6 training hours per day). Training will be provided in train-the-trainer format.
- End User Training - in lieu of Training the Trainer Intrado can provide all End User Training. Training is provided to a maximum of eight End User call takers/dispatchers, per training session, with a maximum of two training sessions per day. One workstation for each two students is required. Intrado includes sufficient days to have up to 8 trainees per session, for all call takers at a VIPER Power 9-1-1 site upon deployment, i.e. Number of sessions = Number of call takers divided by 8 Additional Optional Training days for a maximum of eight End User call takers/dispatchers per session may be purchased to accommodate all call taker/dispatchers.

16.7 AD HOC TRAINING

CENTURYLINK will provide onsite technician support on ad-hoc basis, at no additional charge to PSAP, to demonstrate features for call taker supervisors. This is not in lieu of formal training.

17.0 CENTURLINK LEVEL OF SUPPORT

17.1 REPAIR AND RESPONSE TIMES

CENTURYLINK Response Times includes the following with our Next Gen 9-1-1 Managed Services Agreement. Response Time shall be defined as the amount of time expired between the time in which the issue is detected by the CENTURYLINK NOC to the time that a qualified technician is on-site and actively troubleshooting the issue.

- CENTURYLINK shall provide designated PSAP personnel with notification of an outage within thirty (30) minutes after discovering a service affecting issue. Notification shall be made via a mutually agreed upon means, e.g., phone, email, text, or a combination thereof. Updates on the service affecting issue shall be provided no later than two hours after initial notification with updates being provided as mutually agreed upon between designated PSAP personnel and CENTURYLINK.
- Response Time Coverage - Seven (7) days per week, 24 hours per day, 365 Days of the year with a two (2) hour (maximum) response time to have a CENTURYLINK technician on site for all 9-1-1 related hardware, software, network repair/maintenance issues or events. This includes all Holidays.
- Response Times for PSAPS in Maricopa Region and Pima County will be provided in a 90 minute (maximum) on-site response time.
- One (1) 800 Number is provided to all PSAP's for both 9-1-1 Network and Equipment repair issues. This also improves response times whereas the PSAP's do not need to call two different numbers to open a repair 9-1-1 call.
- If the issue that was called in cannot be resolved through our CENTURYLINK remote diagnostics and repair Network Operations Center (NOC), then a technician shall be on-site within the above stated response times.
- The CENTURYLINK 9-1-1 NOC has a call-answering objective of answering 90% of all 9-1-1 calls within 20 seconds.
- In the event that a system has failed completely, the 9-1-1 System Administrator shall be updated hourly by the Arizona 9-1-1 CENTURYLINK Service Manager, Account Team and or Network Operations Center.
- If the system is anticipated to be down longer than 24 hours, the State 9-1-1 Administrator and State 9-1-1 office shall be notified immediately.
- CENTURYLINK provides new and updated escalation list(s) to the PSAPs in our monthly and quarterly PSAP and State 9-1-1 meetings. The PSAP can escalate at any time to the local dedicated 9-1-1 CENTURYLINK account team and Area Operations personnel.
- To assure that quicker response times are met, CENTURYLINK maintains manufacturer-recommended maintenance components at twelve (12) local Arizona CENTURYLINK installation and maintenance facilities. Some maintenance spare parts are also housed at the 9-1-1 PSAP facility depending on the location and size of the PSAP.

- Remote VPN (Virtual Private Network) access is being implemented as part of our Managed Services that also improve(s) response times.

17.2 TROUBLESHOOTING:

Trouble Ticket Resolution and Coordination with Solution Partners/ Manufacturers:

- CENTURYLINK 9-1-1 NOC uses Solution Partners/Manufacturers Web-based portals to track all manufacturer related 9-1-1 equipment issues. These portals provide CENTURYLINK with a fast, easy way to communicate directly with the 9-1-1 equipment manufacturer's in real time. CENTURYLINK can prioritize the severity of the repair problem with each vendor.
- The portals also allow CENTURYLINK to review and identify other 9-1-1 locations within the CENTURYLINK territories that are having some of the same or identical manufacturer repair issues.
- These online tracking site(s) will allow CENTURYLINK to get hourly, daily, or weekly Service Ticket Alerts via e-mail for additional tracking purposes. The Web-based service and support command center provides CENTURYLINK with a direct escalation process for open manufacturer issues.
- These sites also are used by CENTURYLINK to complete Return Material Access (RMA) and track on repair equipment if a part needs to be returned. Using CENTURYLINK to complete all of the problem tracking and follow up procedures eliminates the need for the 9-1-1 PSAP personnel to complete this task.
- The following steps are taken for escalation and coordination with our 9-1-1 Partners as outlined below:
    - Step 1 CENTURYLINK NOC Tier 2 support interfaces directly with our approved 9-1-1 equipment partners. A case ticket is opened through the online CENTURYLINK manufacturer portal. CENTURYLINK prioritizes the ticket as an escalation on the Web site and this is instantly marked high priority.
    - Step 2 - All of the high priority repairs are reviewed with the 9-1-1 equipment manufacturers hourly, daily, and discussed on weekly conference calls if required.
    - Step 3 - The PSAP is provided progress reports via e-mail updates, through conference calls and service meetings.
    - CENTURYLINK also is notified through Partners Product Bulletins and Notices of trouble solutions and resolutions from each Manufacturer that also will assist in getting the trouble ticket closed.
        - CENTURYLINK also provides Business Solutions Alerts of any Arizona 9-1-1 outages that may be caused from Cable cuts, Fiber cuts or equipment failures. The State 9-1-1 Administrator and State 9-1-1 office are notified along with the PSAP(s) affected of such outages via our Arizona 9-1-1 service manager.

    - Step 4 – If it is determined that a patch or firmware upgrade is required from the Manufacturer, CENTURYLINK will keep the trouble tickets opened until final resolution of the ticket from the manufacturer.
    - Step 5 – Repair is resolved. If a Patch or Firmware is needed it will be installed remotely.
    - Step 6 – PSAP is notified of repair resolution and ticket is not closed with Partner until PSAP provides CENTURYLINK NOC or technician with authorization to close the ticket.
- Included in our Managed Services offering is monitoring and response from our 9-1-1 Managed Services Partners. If CENTURYLINK partners recognize a repair issue at the PSAP site through the remote monitoring process, the partner will open up a ticket with CENTURYLINK NOC. Same steps are followed for escalation and closure of ticket.
- CENTURYLINK 9-1-1 account teams can also view and track resolution during the repair process on the partner portal.

Feet-on-the-street support

- CENTURYLINK has been installing, maintaining, and servicing 9-1-1 CPE and Network for over 25 years in the State of Arizona. Over the past eighteen years, CENTURYLINK has planned, installed, and maintains over 70 PSAPs in Arizona for 9-1-1 equipment and network. Currently in Arizona, CENTURYLINK has dedicated certified 9-1-1 technicians strategically located in Northern and Southern Arizona. CENTURYLINK technicians are certified annually on any new product(s) by our 9-1-1 manufacturers. In addition to our dedicated 9-1-1 technicians, we also provide 9-1-1 network support on the current WAN/LAN IP and Digital networks.
- CENTURYLINK 9-1-1 technicians provide installation and maintenance support Seven (7) days per week, 24 hours per day, 365 Days per year to our 9-1-1 PSAP Centers.
- Feet on the street support will be provided by CENTURYLINK 9-1-1 Technicians, Data Technicians, Network Technicians and CENTURYLINK Contractors. We also will provide System Design engineering if needed.
- CENTURYLINK provides local System Design and engineering support for 9-1-1 Network, Equipment and integration as part of our Managed Services offering as needed.

18.0 DOCUMENT REFERENCES

1	AZ NG9-1-1 Design
2	2014 Compliance Management Tearsheet
3	Savvis – 2013 Type 2 – SOC 1 Report
4	CIDB-AdditionalData Interface for A9-1-1_Version 1.1
5	ECRF-LoST Interface for A9-1-1_Version 1.1
6	ESRP Terminating Interface for A9-1-1_Version 1.0
7	LIS-HELD Interface for A9-1-1_Version 1.1
8	PBN-2013-Third Party IP-Recording Kit
9	Vesta SMS_PB 06-2014
10	PAD Datasheet

19.0 "AZ NG9-1-1 DESIGN" DOCUMENT – DRAWING TABS

Tab	Description
ESInet	Drawing showing the MPLS network that comprises the ESInet and includes: LSR to LNG LNG to ECMC ECMC to CPE Hosts – VIPER and VESTA
LNG	Drawing includes the major equipment and network design within the LNG Data Centers, showing route diversity and equipment diversity
VIPER MPLS	Drawing of the VIPER Host/Remote MPLS Network.
VIPER ECMC	Drawing of major components in Intrado's ECMCs including VIPER host and the Intrado cloud
VIPER Remote	Drawing showing typical network connectivity to remote site with diverse PSAP and Central Office equipment. Local loop will be redundant and not diverse, meaning, all in one sheath or trench. Includes typical VIPER equipment to be installed in each PSAP backroom.
VIPER Workstation	Drawing of VIPER workstation equipment with handoffs to recorder and radio (for headset integration)
VESTA MPLS	Drawing of the VESTA Host/Remote MPLS network
VESTA Host	Drawing of VESTA Host sites, showing the major equipment and network design within the VESTA Host Data Centers, showing route diversity and equipment diversity
VESTA Remote	Drawing showing typical network connectivity to remote site with diverse PSAP and Central Office equipment. Local loop will be redundant and not diverse, meaning, all in one sheath or trench. Includes typical VESTA equipment to be installed in each PSAP backroom
VESTA Workstation	Drawing of VESTA workstation equipment with handoffs to recorder and radio (for headset integration)

9-1-1 Managed Services Technical Review

PHASE II – TASK 4

WRITTEN REVIEW OF CENTURYLINK RESPONSES

UPDATED VERSION SUBMITTED AUGUST 2014 TO: STATE OF ARIZONA 9-1-1 PROGRAM

MissionCriticalPartners

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1. BACKGROUND

The State of Arizona 9-1-1 Program (Program) has retained Mission Critical Partners, Inc. (MCP) to support its review of CenturyLink's Managed Services offering. This document summarizes the additional information that the Program requires CenturyLink to provide in order to complete its evaluation of the proposed services.

The topics are separated into two lists: contractual documentation requirements and general clarification of services. Each table contains headers of Topic Area, Commentary, and Reference. The Topic Area section provides a brief description of the issue. The Commentary section describes the issue in detail. The Reference section, which is contained in Table 2, provides the CenturyLink document title.

Table 1 – Technical Documents Reviewed

Document Name	Description
A9-1-1 Great Migration Plan for AZ	June 2012 proposal for bundled, managed NG9-1-1 services offering
AZ NG9-1-1 Technical Review 4-14-14	CenturyLink Next Gen 9-1-1 and Managed 9-1-1 CPE Technical Overview for Arizona Solution
Clearview reports - A911	Guide for using Clearview reporting tool
Managed 911 - Service Level Goals - 6-11-2013	Description of CenturyLink Service Level Goals for 9-1-1 Routing and ALI Management Services
MapSAG	Intrado marketing sheet for MapSAG product
MPLS SLAs 6-11-2013	CenturyLink MPLS VPN Service Level Agreement
NG911 Managed Services - Arizona Network	Detailed network diagram
PAD MOP CenturyLink Work and Testing Instructions 102313CH Final	Work instructions document for PSAP Abandonment Device (PAD)
PowerProbe6000AndPowerProbe500_CCW-20472-0_DS_NM_0	PowerProbe marketing booklet for PowerProbe 6000 and PowerProbe 500 devices
Denver dn1	CenturyLink marketing sheet for Denver 1 data center
Denver dn2	CenturyLink marketing sheet for Denver 2 data center
Denver dn3	CenturyLink marketing sheet for Denver 3 data center
MCP Responses Set 1 sed	CenturyLink responses to MCP's request for additional documentation
PBN-2013-Third Party IP-Recording Kit	Intrado's IP recording product bulletin

2. CONTRACTUAL DOCUMENATION REQUIREMENTS

The Program requires CenturyLink to incorporate all of the commitments, service descriptions, processes, and service-offering documentation into a single, consolidated CenturyLink Services Exhibit (Exhibit). The Exhibit should detail the scope of services and act as a guide to the Program and the state's public safety answering points (PSAPs), with sufficient detail so that the reader will have a good understanding of the features, functionality, and operational procedures related to the services. It is anticipated that existing documentation may contribute to the development of the Exhibit. Should CenturyLink choose to use the referenced documentation, the Program requires updates to the text as detailed in Table 2.

At a minimum, the Exhibit should include the following outline of service topic areas:

1. Managed Services Offering Description (general description of included services)
2. A9-1-1 Emergency Services Internet Protocol (IP) Network (ESInet)
    a. Network design and management descriptions
    b. Updated network diagrams
3. A9-1-1 Routing
    a. Alternate and abandonment routing configuration options
    b. PSAP abandonment device (PAD)
    c. Legacy Network Gateway (LNG)
4. A9-1-1 i3 Routing
    a. Emergency Services Routing Proxy (ESRP)
        i. Queue management capabilities
    b. Policy Routing Function (PRF)
        i. User interface description
        ii. Available policies
    c. Location Validation Function (LVF)
        i. Data management portal
    d. Emergency Call Routing Function (ECRF)
        i. Spatial Information Function (SIF) updates
    e. Border Control Function (BCF)
    f. Forest Guide
5. A9-1-1 Location Data Management
    a. Automatic Location Identification (ALI)
    b. Location Information Server (LIS)
    c. Call Information Database (CIDB)
    d. 9-1-1 Net
    e. Enterprise Geospatial Data Management System (EGDMS)
6. A9-1-1 VIPER
    a. i3 Guarantee
    b. Power 911

    c. MapFlex
    d. Power MIS
    e. Logging interfaces and support
7. VESTA
    a. i3 Guarantee (if applicable)
    b. Sentinel
    c. ORION Vela
    d. ORION DataSync
    e. Aurora
    f. Logging interfaces and support
8. A9-1-1 Geographic Information System (GIS) Data Management
    a. MapSAG
9. A9-1-1 TXT29-1-1
    a. Integrated with Power 911
    b. Browser description
10. A9-1-1 Data
    a. Address Intelligence
    b. Media
11. Reporting and Logging
    a. ClearView
    b. i3 Event Logging
    c. PowerProbe
12. Program Management Support
    a. Product lifecycle management
    b. Software and hardware refresh program
    c. Out-of-scope requests
13. Training
    a. A9-1-1 systems and support applications
        i. On-site
        ii. Ad-hoc
        iii. Web-based
    b. Call handling systems
        i. On-site
        ii. Ad-hoc
        iii. Web-based
14. Maintenance, Monitoring and Support
    a. System backup
    b. System maintenance
    c. Network operations center (NOC) support
    d. Notification times for service-affecting outages
    e. Response times
    f. On-site response times

g. Repair times
h. Incident severity levels
i. Security incident severity levels

15. Service Level Agreements
    a. Software update timing
    b. Proactive hardware refresh
    c. Firmware updates
    d. Network performance metrics
    e. Maintenance response and repair times
    f. i3 Guarantee
16. System Availability Metrics
    a. Reporting
    b. Security incidents
17. i3 Guarantee
    a. Explanation of the guarantee

MCP Response:

For Task 6 of the second Phase of the Managed Services Technical Document Review project, CenturyLink developed a comprehensive Services Exhibit as requested above. Throughout the month of July 2014, MCP worked with CenturyLink and the Program to refine the Exhibit to meet the Program's requirements. As noted in the "Phase II, Task 4 Commentary" column below, some items remain open for negotiation between the Program and CenturyLink.

Table 2 – Contractual Documentation Requirements

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
i3 Call Transfers	Please describe how the Managed Services solution will interconnect with other i3 networks, either in-state regional networks or neighboring state networks. The services description should identify transfer services that will be supported, which should include, but are not limited to: voice; text to 9-1-1; location data; supplemental data; call types; the i3 interface(s) and protocols that will be used; physical points of interconnect; and whether additional fees may apply for said interoperability. **CenturyLink Response:** The proposed solution does not contain any provisions for interconnecting other i3 networks. However, interconnecting is available and is described in section 10.2.		Meets requirements. The Program should note that additional fees will be assessed when the need arises for interconnecting with other i3 networks.
Legacy Selective Router Transfers	Please describe whether ALI will be provided in legacy selective router (LSR) call transfers to and from LSRs and switches, including those from alternative service providers. What limitations to LSR call transfers, such as ALI only being available for certain call types, should be included in the documentation? Please describe whether there are any additional costs associated with the connectivity and services described in Section 7.3. **CenturyLink Response:** See new section 7.4 The standard offering includes ALI only transfers with wireless or VoIP calls and not wire-line calls. Given that the State uses CenturyLink ALI databases today, processes could be put in place to use State ALI nodes in place of/to supplement the National ALI nodes so that wire-line ALI could be transferred. This would be additional effort and associated cost beyond the	AZ NG9-1-1 Technical Review 4-14-14, Section 7.2 & 7.3	Meets requirements. Per Task 2, MCP considers this a critical implementation item.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	scope of the current offering and would require CenturyLink commitment. The proposed transition configuration steps include installing a Legacy Selective Router Gateway (LSRG) between the ESInet and the legacy Tandem routers. This makes possible the following services: Allows PSAPs on the ESInet to receive 9-1-1 calls from the Legacy Selective routers until the TSP's have migrated their circuits over to the ESInet. Allows call transfer with additional information between PSAPs still on the legacy tandems and PSAP on the ESInet. Allows call transfer with additional information between PSAPs on the ESInet and PSAPs on the legacy tandems. Intrado assumes connectivity to legacy PSAPs will continue to be provided from the legacy selective routers during the migration phase, The migration strategy includes establishing legacy tandem connectivity to the ESInet at the LSRGs. Legacy PSAPs will continue to receive their 9-1-1 traffic from the legacy selective routers until the PSAPs upgrade to become A9-1-1 Routing (RFAI) or i3-based PSAPs. Optionally, PSAPs could connect to the ESInet and continue to function as legacy PSAPs using Legacy PSAP Gateways (LPG). This enables legacy PSAPs, A9-1-1 Routing (RFAI) and i3-based PSAPs to be homed on the ESInet and they will be able to interoperate by transferring 9-1-1 calls with ANI and ALI. Legacy PSAPs will receive 9-1-1 voice via their existing CAMA trunks and continue to bid ALI until their migration is completed.		

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	Use of the LSRG may eliminate the requirement for Legacy PSAP Gateways (LPGs), since PSAPs migrated to the ESInet can still communicate to PSAPs not yet migrated. Intrado realizes there may be specific cases during the migration process where LPGs are be required and will be provided. If required, specifications of the LPG are provided below: LPG Calls routed via the ESInet and delivered to a legacy PSAP will undergo signaling interworking to convert the incoming Session Initiation Protocol (SIP) signaling to the traditional Multi-Frequency (MF) or Enhanced Multi-Frequency (E-MF) signaling supported by the legacy PSAP. The LPGs will allow legacy PSAPs to receive calls and retrieve Automatic Location Identification (ALI) data the same way they do today. The LPG will also support an ALI interface over which it can receive and respond to ALI queries from legacy PSAPs. Interfaces to a Location Information Server (LIS) and a Legacy Network Gateway (LNG) will also be supported by the LPG so that it can perform a de-referencing operation if the SIP signaling from the ESInet includes a location-by-reference. In addition, the LPG will support an Emergency Call Routing Function (ECRF) interface to facilitate certain emergency call transfer scenarios, as well as interfaces to the Call Information Databases (CIDBs) to provide access to additional non-location data associated with the emergency call, if a reference to such data is provided in incoming SIP signaling. LSR Transfer Limitations Transfers to or from Legacy Selective Routers are voice transfers only. There is no mechanism for transferring the PIDF-LO or the Emergency Incident Data Document (EIDD) to		

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	exchange location data and any other supplemental data or alternatively URIs to the dereferencing systems that would provide the data or data updates to the PSAP. Legacy PSAPs with CAMA connectivity must bid the legacy ALI systems to retrieve location information as they do today regardless of whether they are connected to the ESInet.		
NENA i3 – General	Please describe the PSAPs' i3 migration process, the timing with making the move from legacy systems to i3, and any limitations of the service. **CenturyLink Response:** This has been added to section 11	A9-1-1 Great Migration Plan for AZ – references throughout the document AZ NG9-1-1 Technical Review 4-14-14, Section 12 MCP Responses Set 1 sed	Meets requirements. **MCP recommends** that the Program request that CenturyLink provide a list of requirements or steps for PSAPs to take in order to move from legacy or IP selective router (IPSR) services to an i3 Routing solution.
Emergency Call Routing Function (ECRF) and Location Validation Function (LVF)	Please provide additional documentation on what feature functionality the ECRF and LVF will provide the PSAPs. At a minimum, the additional documentation should describe: the features that these systems will provide; how validations will be made; the interface to the communication service providers (CSPs); how updates to the ECRF are performed; how the GIS data is managed/coalesced between all GIS data providers; how conflicts are managed between GIS data sources; what happens when a CSP's record cannot be validated; and the Internet Engineering Task Force (IETF) Request For Comments (RFC) for those functions that are in compliance. **CenturyLink Response:** This has been added to section 10	AZ NG9-1-1 Technical Review 4-14-14, Section 12.1.1 A9-1-1 Great Migration Plan for AZ, Appendix A MCP Responses Set 1 sed	Meets requirements.
Emergency Services Routing Proxy (ESRP) and Policy Routing Function (PRF)	Please provide additional documentation on the interfaces and protocols that the ESRP will support, its queue management capabilities with the proposed call handling systems, and the	MCP Responses Set 1 sed	Meets requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	IETF RFCs for which the functions are in compliance. **CenturyLink Response:** This has been added to section 10		
Event Logging Service	Please provide additional documentation on the event logging interface, call event log details, and the i3 event logging system's reporting capabilities. **CenturyLink Response:** This has been added to section 10	MCP Responses Set 1 sed	Meets requirements.
Forest Guide	Please provide additional documentation on the Managed Services' support for Forest Guide routing. At a minimum, the additional documentation should describe how the service will interface with a state-level and/or national Forest Guide and what IETF RFCs the system will support pertaining to Forest Guide **CenturyLink Response:** This has been added to section 10	Not applicable	Meets requirements.
i3 Guarantee	Please define the remedies if the Managed Services do not support all i3 functions and protocols, i.e., what is the process for raising concerns regarding i3 compliance after Managed Services go live? Please advise if the i3 Guarantee applies to the entire Managed Services offering, including the Cassidian VESTA call handling solution and its associated applications, such as Aurora, Data Sync, and Vela. Please provide the i3 Guarantee language in a consolidated CenturyLink Exhibit. **CenturyLink Response:** I3 only applies to the Intrado and not to Cassidian. CENTURYLINK has ID all the functions that are supported in the service exhibit. Remedies would be per contact language and will not be a part of the technical response. **August 25th Update:** Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.	A9-1-1 Great Migration Plan for AZ, pages 1, 2 and 4	Meets Requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
PSAP Gateway Manager (PGM) Terminal Server	Please remove PSAP gateway managers (PGMs) from the hosted customer premise equipment (CPE) solution design, including all diagrams and solution descriptions. Support for PGMs is still desired, but only for other CPE systems on the ESInet that do not use the Managed Services' bundled VIPER or VESTA solutions. **CenturyLink Response:** We can remove any PGMs for VIPERs and/or VESTAs that are deployed under this offering. However, The PGM is not the same as a "gateway" it is a group of products including terminal server for rebooting routers and will be installed at the host sites. I have removed from the drawings.	AZ NG9-1-1 Technical Review 4-14-14, Section 5.0, third bullet NG911 Managed Services - Arizona Network Diagram	Meets requirements. Per Task 2, MCP considers this a critical implementation item.
Redundant	Please describe the redundancy of critical support components such as the network operations center (NOC), monitoring systems, provisioning systems, backup systems, and data archive systems. **CenturyLink Response:** The CenturyLink 911OPS center has an established Disaster Recovery Plan and a back up location that is tested yearly to insure continuity of the NOC Center. Short term issues we can roll our calls to another group located in Denver, and Long term we have the alternate site located in St. Paul MN that can be staffed in approximately 30 minutes. The 911 Profiles and ticketing system are located on redundant servers and interconnected utilizing the company CO-LAN network. The NG911 provider has the actual provisioning, monitoring, and call data bases for the NG911 network and they will need to provide information regarding those systems Please advise if redundant Layer 2 connectivity between the VESTA cores is appropriate. If not appropriate, please advise on what effect will be experienced if the single Layer 2	NG911 Managed Services - Arizona Network Diagram	Meets Requirements. Per Task 2, MCP considers this a critical implementation item.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	connection between the VESTA hosts is severed. What will happen to in-progress calls and the synchronization of systems? **CenturyLink Response:** Layer 2 connectivity between VESTA cores uses best practice, 2 redundant connections. Diagram updated.		
	Please provide details where redundant and diverse IP is not available to the PSAP. **CenturyLink Response:** Diverse is an option for all PSAPs, but for this service offering, all remote PSAPs will use redundant loops, not diverse loops (separate entrance facility with 25 feet separation). All network CPE will be diverse. Please provide detailed network mapping down to the card level, to ensure that there is no single point of failure. **CenturyLink Response:** Card level mapping will be provided when orders for circuits are placed. This is not reserved before orders placed. Host site drawings do show the diverse RODAMs and devices	AZ NG9-1-1 Technical Review 4-14-14, Section 6.1	Meets requirements. Per Task 2, MCP considers this a critical implementation item. Confirmation of the redundant network loops with no diversity provides the Program and the state's PSAPs with an understanding of the environment in which they will be operating. This scenario is no different than what the PSAPs have today and therefore should not be considered a downgrade in service or an additional risk to the PSAP's operations. It is understandable that card level mapping is not available until circuit orders are placed. MCP has inserted the card mapping commitment in Section 5.2 of the Services

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
			Exhibit.
Proper Gateways for Service Providers	Please provide a service description in the consolidated Exhibit detailing the points of interconnect (POI) for Session Initiation Protocol (SIP) call delivery, and the process for migrating carrier traffic from the gateways to the SIP POIs. **CenturyLink Response:** Added to Section 10.4.2	AZ NG9-1-1 Technical Review 4-14-14, Section 11.0	Meets requirements
PSAP-to-PSAP Communications	Please provide a commitment in the Exhibit for monitoring the call transfer volumes and adjusting capacity accordingly, similar to the language regarding ingress traffic monitoring. **CenturyLink Response:** Reworded paragraph below As a PSAP is migrated to a NG PSAP, CenturyLink will replace the existing EM trunks from the Legacy Selective Router (LSR) to the PSAP with SR trunks from the LSR to the LNG Gateways. CenturyLink's recommended design will be a ratio of (1.3) ES trunks for every (1) legacy EM trunk. Additionally, trunks from the LNG to the LSR are needed to support call transfers from NG PSAPs to Legacy PSAPs or vice versa, which may also impact the required ratio. During the migration of PSAPs from the legacy network to the ESInet, CenturyLink will monitor the traffic volumes and may adjust this ratio up or down as needed. See section 10.4	AZ NG9-1-1 Technical Review 4-14-14, Section 11.0 "Additionally, trunks from the LNG to the LSR are needed to support call transfers from NG PSAPs to Legacy PSAPs or vice versa, which may also impact the required ratio."	Meets requirements.
Text Integration	Please provide documentation in the Exhibit explaining that the Cassidian solution will provide text delivery directly to the call handling user interface (UI). It is the Program's desire that this functionality be similar across both call handling platforms, in order to enable call takers to process text messages in the call taking UI without the need for a separate window or Web-browser.	AZ NG9-1-1 Technical Review 4-14-14, Section 7.1	Meets requirements. The topic of text-to-9-1-1 service being included in the Managed Services offering is a separate item that is to be negotiated by the Program.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	CenturyLink Response: Text messaging integration is now being offered on Cassidian VESTA as well as Intrado's VIPER system. This interface is included with the proposed solution to Arizona PSAPs at no additional cost. However, a text messaging service is required to move text messages from wireless carriers to NG9-1-1 enabled PSAPs. This service is not a part of the CenturyLink proposed solution. For PSAPs requiring this functionality, CenturyLink can provide per-seat pricing options. Cassidian documentation for support of text messaging is attached, VESTA SMS_PB 06-2014		
Security	Please provide details in the consolidated Exhibit defining "appropriate levels of security," "industry standard security procedures," and "security measures." Please provide details in the consolidated Exhibit that CenturyLink performs background checks on all staff that have access to the system, including sub-contractors and solution partners. **CenturyLink Response:** See New Section 5.5 and down	AZ NG9-1-1 Technical Review 4-14-14, Section 6.2 Bold formatting applied by MCP to highlight the statements referenced: "The iQ MPLS private port will have the **appropriate levels of security** in place both at the physical and application layers." "The CenturyLink provided iQ MPLS private port will have the **appropriate levels of security** in place both at the physical and application layers, as determined within IPP. CenturyLink will secure	Meets requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
		the CenturyLink-provided iQ MPLS private port using **industry standard security procedures** against security attacks from other networks or the public Internet. "CenturyLink will **employ security measures** where a PSAP may have dual-homed CPE (connected to both the CenturyLink solution and another service provider's network)."	
PowerProbe Servers	What PowerProbe services will be provided in the Managed Services offering? Details should include what metrics (if any) will be made available to the Program and PSAPs. Will metrics be available on an ad hoc, per call basis, or in consolidated daily/weekly/monthly reports? **CenturyLink Response:** PowerProbe servers will be used to simulate VoIP traffic for benchmarking and service assurance. Not reports are available on these products. All metrics will be included in the ClearView reports. CenturyLink Response: P1 grade of service is the responsibility of each carrier. CenturyLink will continue to measure P1 grade of service as it does today. CentryLink will run and provide these reports as follows: • 30 Days after a PSAP has migrated. • On a quarterly basis for all migrated PSAPs The frequency of these reports will ensure that a P1 grade of	PowerProbe6000AndPowerProbe500_CCW-20472-0_DS_NM_0	Meets requirements. The commitment to provide reports is detailed in Section 12.10.1 of the Services Exhibit.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	service is being maintained. These reports will be made available to the PSAPs and will be included		
System Backup	Please provide details for system backup. These details should be provided in the consolidated Exhibit with information on what systems are backed up; the frequency of backups; and the process for change management, backup retrieval and restoration. **CenturyLink Response:** See New Section 6	All documentation	Meets requirements. Per Task 2, MCP considers this a critical implementation item.
Local GIS data management with each of the nineteen 9-1-1 systems	Please provide additional detail in the consolidated Exhibit regarding the tools, processes and limitations related to the sharing and coalescing of 19 GIS datasets into an enterprise GIS database. Please provide additional detail in the consolidated Exhibit describing the ability of the Managed Services to field map the GIS data schema so that the nineteen 9-1-1 systems may continue to manage their GIS data as they do today. The solution description should describe any limitations to unique field mapping for up to 19 data sources. **CenturyLink Response:** Added Section 14	Not Applicable	Meets requirements. Per Task 2, MCP considers this a critical implementation item.
Enterprise map updates to be provided to each PSAP	Please provide additional detail in the consolidated Exhibit describing the process for updating the remote GIS application servers. The Exhibit should describe how the solution will support a state-level, enterprise map that publishes updates to multiple call handling host systems, which then feed each of the remote PSAPs' GIS application servers. Limitations and assumptions of the Managed Services should be stated in the consolidated Exhibit. **CenturyLink Response:** Added section 14	AZ NG9-1-1 Technical Review 4-14-14, Sections 15.3, 15.4 and 15.5	Meets requirements. Per Task 2, MCP considers this a critical implementation item.
Ingress Network Design	Please incorporate a solution design that enables CSPs to	AZ NG9-1-1 Technical	Meets Requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	direct connect to LNGs initially, and not in a phase after deployment. **CenturyLink Response:** CenturyLink will not allow CSPs (assuming you mean Frontier, etc) to direct connect in the initial phase. This will take additional planning and coordination to accomplish as well as interconnect agreements, etc and costs will need to be determined at that time. Intrado Response: We encourage the direct connection of CSPs to the LNGs, however as noted this is not in scope of this project, timing can depend on the Carriers, and on factors not under Intrado or CenturyLink's control. We would also like to understand how this is reconciled with the request to have SIP ingress; is this to be the same as the SIP ingress request, or direct connect through legacy connectivity. If the latter, that is standard connectivity to the LNGs just as the connection from the LSR to the LNGs. Would also like to discuss with the State what functionality/resilience enhancements desired with this architecture so we may understand the motivation for the request. Added sentences to document in Section 10.4.1 **August 25th Update:** Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.	Review 4-14-14, Section 11 "As the PSAP is migrated to a NG PSAP, CenturyLink will update the routing in its LSR and based on ESN, deliver the call over the EM trunks to a legacy PSAP or over the SR trunks to the LNG and then over the ESInet to a NG PSAP."	
Egress Network Design	Please insert a statement to the effect of "Regardless of bandwidth sizing, the Managed Services fees will provide for the bandwidth required to deliver services between the host CPE sites and each PSAP." **CenturyLink Response:** This is not the case. If PSAP requests that ringdown lines and PSAP to PSAP conferences	AZ NG9-1-1 Technical Review 4-14-14, Sections 13.7.2 & 13.7.4 "CenturyLink and Intrado will determine the exact required bandwidth each PSAP will	Meets Requirements.

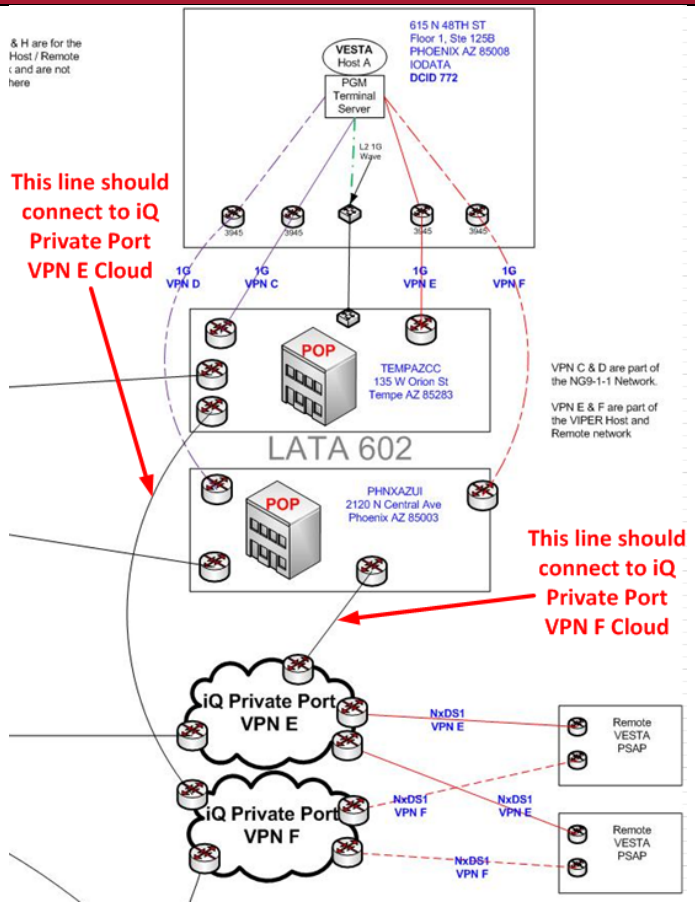
Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	be done over the Host / Remote Network, instead of over the PSTN, then additional bandwidth will be required at remote sites. Bandwidth has been calculated that all ringdowns will be over the PSTN or over customer's network. Admin lines will be used for PSAP to PSAP communications. 911 calls will be placed over the Host / remote networks. If the PSAP would rather pay for the additional bandwidth for the host remote instead of PSTN charges, the cost would need to be weighed at that time so "Regardless of bandwidth sizing" in not approbate. **August 25th Update:** Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.	require after site survey and call flow meeting has been conducted. Remote PSAP bandwidth above is only for estimating Host bandwidth requirements."	
Data center bandwidth and ECMC to VIPER configuration	The referenced material does not specify bandwidth allotment between the Intrado Emergency Call Management Complex (ECMC) data centers in Miami and Englewood. In review of the solution design, MCP sees the most resilient solution design as the one that provides either ECMC with the ability to set up calls with either VIPER host. For example, the Miami ECMC may send calls to the Englewood VIPER in situations where the Miami VIPER is down and vice versa. The referenced diagram indicates that the Miami ECMC only delivers calls to the Miami VIPER and the Englewood ECMC only delivers calls to the Englewood VIPER. If represented accurately, this configuration would be detrimental to the solution's availability, as a failure of either VIPER or ECMC would effectively take down the availability of its collocated partner ECMC or VIPER system. **CenturyLink Response:** Both the old and new drawings show both VPN into each data center. Hopefully, the new drawings will make that a bit clearer.	AZ NG9-1-1 Technical Review 4-14-14, Section 13.6 NG911 Managed Services - Arizona Network Diagram	Meets requirements. Per Task 2, MCP considers this a critical implementation item.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	Please clarify the ECMC/VIPER solution design and the bandwidth requirements between the Miami and Englewood data centers. A meshed configuration between the ECMCs and VIPERs is recommended. MCP believes that it is the intent that virtual private networks (VPNs) C & D provide the meshed connection between ECMCs and VIPERs; however, the VPNs between the ECMCs and VIPERs are not labeled on the referenced diagram.		
	Please update the referenced diagram to depict the iQ Private Port VPN C & D clouds connecting the two ECMCs. **CenturyLink Response:** Please see updated drawings	AZ NG9-1-1 Technical Review 4-14-14, Diagram above Section 14.4	Meets requirements.
VPN C & D	In the referenced documentation, MCP believes that VPNs C & D are not only local, but provide connectivity between data centers and points of presence (POPs). Please confirm this understanding and if true, then CenturyLink should delete the word "local" in the second bullet in Section 14.4, as the VPNs provide connectivity beyond the local ECMC and VIPER node. **CenturyLink Response:** For Intrado VIPER, this can and is local. For VESTA, it is not local.	AZ NG9-1-1 Technical Review 4-14-14, Section 14.4 NG911 Managed Services - Arizona Network Diagram	Meets requirements.
Inter-VIPER Network	The referenced VIPER diagram shows a network connection between VIPER primary node and VIPER secondary node. This network connection and its associated bandwidth are not discussed in the Technical Review document, nor is it depicted in the NG911 Managed Services – Arizona Network Diagram. **CenturyLink Response:** All bandwidths are discussed in the technical review. See section 17. Please clarify if this network connection will be provided in the Managed Services offering. If it is required, then CenturyLink should update the diagrams to reflect this connectivity and add	AZ NG9-1-1 Technical Review 4-14-14, VIPER Diagram titled "Multi-Node" above Section 15.3	Meets requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	language to the consolidated Exhibit detailing the bandwidth required between the two systems. **CenturyLink Response:** VIPER has no layer 2 connectivity between hosts. Workstations will point to second node when 1st node is lost. MCP recommends that this connectivity be on separate VPNs similar to the rest of the solution design. **CenturyLink Response:** See updated drawings		
VIPER Configuration	The referenced diagram depicts the VIPERs in a primary/secondary configuration. An active-active solution design combined with a meshed configuration with the ECMCs will enable both systems to be continually active in processing calls between both ECMCs for all PSAPs. **CenturyLink Response:** VIPER will be in a Primary and Secondary configuration. It is not configured Active/Active. However, some positions will have Node A as primary and node B as secondary and vice versa for others. Is the VIPER configuration able to be configured such that either node is constantly processing calls in a balanced manner between ECMCs, and that both sites will be sized to process 100 percent of the expected calls with room for future expansion? The details of the CenturyLink response should be reflected in the consolidated Exhibit. **CenturyLink Response:** VIPERs are configured to process 100% of calls in the State of Arizona for all positions failing over to one host.	AZ NG9-1-1 Technical Review 4-14-14, VIPER Diagram titled “Multi-Node” above Section 15.3	Meets requirements. Per Task 2, MCP considers this a critical implementation item.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
VESTA Configuration	The referenced diagram depicts main and backup sites. Per the discussion immediately above, please clarify if the VESTAs are configured as active-active or in a primary/secondary configuration, and that both sites will be sized to process 100 percent of the expected calls with room for future expansion. The details of the CenturyLink response should be reflected in the consolidated Exhibit. **CenturyLink Response:** VESTA does not work in an Active / Active configuration, only Active / Standby is supported. Therefore, each core is configured to support 100% of the expected call volumes and will be sized accordingly. The layer 2 connection between cores will be configured as well to handle 100% of call volume.	AZ NG9-1-1 Technical Review 4-14-14, VESTA Diagram below Section 15.2	Meets requirements. Per Task 2, MCP considers this a critical implementation item.
VESTA Host Site Consoles	The referenced diagram shows consoles at host sites. This will not be the case. Please update the diagram to accurately reflect the services/systems that will be deployed. **CenturyLink Response:** The mentioned drawing is a "Typical Host Remote system, not Arizona Specific. Please refer to Arizona specific drawing that shows all consoles at remote site	AZ NG9-1-1 Technical Review 4-14-14, VESTA Diagram below Section 15.2	Meets requirements.
IP Routers	In the referenced diagram, it appears that the IP routers located in each location are logical representations and not physical representations. Please confirm this interpretation and if correct, then request that CenturyLink add a note to the diagram with an explanation of logical representation of routers. **CenturyLink Response:** See updated diagrams	NG911 Managed Services - Arizona Network Diagram	Meets requirements.
Tempe POP and VPN A	In the referenced diagram, the Tempe POP in the left, middle section of the diagram in LATA 602 shows VPN A ingress to the Tempe POP, with its egress connectivity to the iQ Private Port VPN B cloud. MCP believes that this is an error and the	NG911 Managed Services - Arizona Network Diagram	Meets requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	egress connectivity from this POP should connect to the iQ Private Port VPN A cloud. Please review the diagram and advise if this observation is correct. If confirmed, please provide an updated diagram. **CenturyLink Response:** See updated diagrams		
VPN E & F	In the referenced diagram, MCP believes that the VPN E & F notes to the right of the Englewood data center and below/right of the Phoenix VESTA host (in the upper right corner) should be updated to state "VPN E & F are part of the ***VESTA*** Host and Remote network." It currently reads "VPN E & F are part of the ***VIPER*** Host and Remote network." Please review the diagram and advise if this observation is correct. If confirmed, please provide an updated diagram. **CenturyLink Response:** See updated diagrams	NG911 Managed Services - Arizona Network Diagram	Meets requirements.
Phoenix VESTA Host Connections to VPNs E & F	In the referenced diagram, VPN E connects from the Phoenix VESTA host to the Tempe POP, which connects to the iQ Private Port VPN F cloud. Similarly, VPN F connects from the Phoenix VESTA host to the Phoenix POP, which connects to the iQ Private Port VPN E cloud. MCP believes that the Tempe POP should connect to the VPN E cloud and the Phoenix POP should connect to the VPN F cloud. **CenturyLink Response:** See updated diagrams	NG911 Managed Services - Arizona Network Diagram	Meets requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	 Please review the diagram and advise if this observation is correct. If confirmed, please provide an updated diagram.		
VESTA Layer 2 Connection	Discussed in “Redundant” topic area above. The referenced diagram shows a single Layer 2, one gigabit per second (Gbps) connection between the two VESTA host	NG911 Managed Services - Arizona Network Diagram	Meets requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	sites. Please explain if the Layer 2 connection is mission critical. If not, what processes are in place with the VESTA systems at the host sites that provide for delayed synchronization if the Layer 2 network connection is severed? If the connectivity is mission critical, then please provide a cost-benefit analysis for providing the VESTAs with redundant connectivity via diverse POPs. **CenturyLink Response:** This will be (2) Layer 2, see updated diagram		
Primary/Secondary VPNs	MCP believes that the referenced diagram indicates that there are primary and secondary VPNs between all components in the network. Active-Active path management provides the greatest level of reliability to ensure that no equipment or route path is ever sitting stagnant. Please explain if the primary/secondary VPN configuration is accurate. If so, please explain how the solution is configured so that load balancing is achieved across all components, VPNs, and IP routers for every PSAP, to enable a fully meshed solution where no component or path is stagnant. **CenturyLink Response:** VPNs will be Active / Active at the Layer 2 level. CenturyLink will be running eBGP (Layer 3) over the MPLS interfaces. BGP is not a load balancing protocol. CenturyLink is including Network Monitoring services (NMS) in the proposed solution. NMS will send “hello” and “ack” messages to PSAP routers ensuring the circuit is still up and active. This configuration is an industry “best practice” for multi-homed links using the MPLS architecture through multiple POPs and Tera-POPs.	NG911 Managed Services - Arizona Network Diagram	Meets requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
CenturyLink Washington Outage	The CenturyLink/Intrado A9-1-1 outage that occurred on April 9-10, 2014, has raised concerns regarding the proposed solution design. Upon reading the referenced outage report, it was learned that the "ticket" threshold alarm was a minor category issue that resulted in thousands of calls not being routed to the proper PSAP. As such, the Program requests that CenturyLink conduct an audit of the A9-1-1 system alarms to review if there are other alarms that are categorized as minor that should be moved to major. **CenturyLink Response:** Intrado has completed a review of alarms generated from the core application processing elements, and they verified alarm levels and in some cases adjusted specific alarm messages to be more specific. The Program requests that CenturyLink provide a report of findings resulting from Intrado's A9-1-1 architecture review. **CenturyLink Response:** Intrado completed architecture reviews to ensure that no conditions exist that can stop the call processing logic and verified that access resources cannot be exhausted. Intrado also added architecture capabilities that will forward call processing from one redundant core to another core in any unforeseen situation in which call processing may be compromised. Finally, alarm messages were added to observe calls received patterns, which will alarm if calls are not appropriately processing through the system. The Program requests that CenturyLink share the corrective actions that are being taken to address NOC-to-NOC challenges. **CenturyLink Response:** CenturyLink and Intrado NOC to	CenturyLink Major Outage Report to the Washington Utilities & Transportation Commission: http://wa-bainbridgeisland.civicplus.com/AgendaCenter/ViewFile/Item/382?fileID=1386	Meets Requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	NOC process changes include the following: • A "Meet Me" bridge will be established between the two NOCs to enable an immediate line of communication when a customer impacting event is detected, • The abandonment reroute process has been streamlined and unnecessary steps in the approval process have been removed, • Intrado and CenturyLink have established a process to conduct joint troubleshooting and validation, and • There will be a monthly review of the last 30 days of tickets and incidents, and processes will be reviewed and updated as needed. The Program requests that CenturyLink assure the State of Arizona that lessons learned from the ingress trunking configuration in Washington be applied to the network design for Arizona, and that diagrams be updated with accompanying notes detailing what updates were made to the proposed solution design. **CenturyLink Response:** CenturyLink and Intrado are currently working together to create an environment where the traffic is more evenly distributed between the Intrado ECMC's located in Englewood and Miami. CenturyLink and Intrado are also working to distribute End Office traffic equally between Intrado's Trunking Gateways (TGW) where feasible. For Load Balancing purposes, CenturyLink and Intrado will home half of the End Offices to use a primary and a secondary trunk group and home the other half of the End Offices to use the reverse (subject to the capabilities of the switching infrastructure). Finally, traffic analysis will need to be completed to group the set of End Offices to the appropriate trunk groups.		

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	August 25th Update: Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.		
Service Level Agreements	The Program requests CenturyLink to provide service level agreements (SLAs) for the Managed Services. These SLAs should define the timing for refreshing (replacing or updating) the components of the solution, as related to software, hardware, firmware, and network performance. CenturyLink SLAs must have significant remedies to ensure the maintenance and service of the system at the agreed upon levels of service. CenturyLink SLA metric reports must be provided monthly and be independently verifiable through system reports. As such, the Program requests read-only access to the monitoring and reporting systems. SLA topic areas should, at a minimum, include: 1. Software SLAs addressing feature functionality and the timing for providing software updates to the system once they become available. For example, software updates will be applied to all call handling systems within a pre-determined amount of time from their general availability. 2. Hardware SLAs addressing the refresh cycle for maintaining hardware components, such that the solution is never at risk due to software system requirements, manufacturer discontinued products, and failing hardware. 3. Firmware SLAs stating CenturyLink's commitment to complete manufacturer-recommended firmware updates within a pre-defined timeframe and after lab-based regression testing has been performed with new firmware.	Not Applicable	Meets Requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	4. Network SLAs stating the network performance levels that the PSAPs should expect, such as network availability measured in minutes of downtime per year; jitter threshold; average roundtrip delay; mean opinion score (MOS); call setup time for Centralized Automatic Message Accounting (CAMA) and IP delivery; and packet loss. 5. Maintenance SLAs defining the CenturyLink's response to service-affecting outages for all Managed Services, including the timing of communications to the PSAP and Program. The SLAs should focus on response times and mean time to repair. 6. i3 Guarantee SLA to address when the solution will be updated to meet future i3 versions. For example, the Managed Services offering shall be current with i3 standards, such that all systems will be updated with then-current i3 feature functionality within 12 months of the ratification of each i3 version. 7. Managed Services SLAs defining the levels of service for other mission-critical services, including but not limited to TXT29-1-1, i3 routing functions, and the hosted call handling solution. The SLAs should not be limited to only NG9-1-1 routing and ALI. **CenturyLink Response:** SLA will be addressed in the customer's "PSAP Service Agreement" **August 25th Update:** Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.		
Service Level Goals	Not acceptable. Please revise the Management Availability Performance Goal to be 99.999%. **CenturyLink Response:** This needs to be in Bob's document	Managed 911 - Service Level Goals - 6-11-2013, Section 1.2	Meets Requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	August 25th Update: Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.	"9-1-1 Routing and ALI Management Availability Performance Goal is 99.998%."	
	Please revise the Notification Goal of the Level 1 and Level 2 SLAs to be within 30 minutes per FCC Report and Order 13-158, and include periodic updates until the system is restored. The updated documentation should state that CenturyLink shall perform, and provide a report on, a root-cause analysis of all outages no more than 90 days after the restoration of service. **CenturyLink Response:** *Unanswered* **August 25th Update:** Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.	Managed 911 - Service Level Goals - 6-11-2013, Section 1.2 https://www.fcc.gov/document/fcc-adopts-rules-improve-911-reliability Appendix B, Part 4	Meets Requirements
	Please delete the rolling 2/4/8 months clause from the remedy statement. **CenturyLink Response:** *Unanswered* **August 25th Update:** Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.	Managed 911 - Service Level Goals - 6-11-2013, Section 1.2 "…mean time to repair is not met for a given rolling two months." "…mean time to repair is not met for a given rolling four months." "…mean time to repair is not met over a rolling 8 month period."	Meets Requirements.
	Please update the example for Level 1 so that it is amended as follows (emphasis added to indicate the updates to the existing language):	Managed 911 - Service Level Goals - 6-11-2013, Section 1.2, Level 1 Example	Meets Requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	"PSAP not receiving calls, audio is **not** working **even if only on** intermittent calls, End office traffic is not able to reach PSAP, **not** returning ALI bids, network hardware or circuit failure to data complex." **CenturyLink Response:** *Unanswered* **August 25th Update:** Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.	"PSAP not receiving calls, audio is working only intermittent calls, End office traffic is not able to reach PSAP, returning ALI bids, network hardware or circuit failure to data complex."	
	Please update the example for Level 2 so that it is amended as follows (emphasis added to indicate the update to the existing language): "… system response time problems; single sided ALI function; **single sided routing function**." **CenturyLink Response:** *Unanswered* **August 25th Update:** Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.	Managed 911 - Service Level Goals - 6-11-2013, Section 1.2, Level 2 Example "…system response time problems; single sided ALI function."	Meets Requirements.
	Please update the Notification Goal for Level 3 so that it is amended as follows (emphasis added to indicate the update to the existing language): "as soon as possible **within** 1 day of the identification of the service disruption." **CenturyLink Response:** *Unanswered* **August 25th Update:** Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.	Managed 911 - Service Level Goals - 6-11-2013, Section 1.2, Level 3 Notification "as soon as possible 1 day of the identification of the service disruption."	Meets Requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
i3 Guarantee and Software Evergreen	Please provide contractual language as to how the core i3 functions, call handling systems and GIS applications will be maintained with the latest software versions available, based on then current industry standards, including but not limited to NENA i3 and its associated supporting industry standards. This documentation should address both the Intrado VIPER and Cassidian VESTA systems. **CenturyLink Response:** *Unanswered* **August 25th Update:** Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.	A9-1-1 Great Migration Plan for AZ, pages 1, 2 and 4	Meets Requirements.
Maintenance for Managed Services	Please provide documentation in the Exhibit for response times, coordination of troubleshooting with solution partners, feet-on-the-street support, repair times, and tiered incident management support for all of the Managed Services. If there are differences in how the troubleshooting and support will be provided between the varying services, please provide those details in the Exhibit. **CenturyLink Response:** See Section 8 and Section 17	MCP Responses Set 1 sed, Answer 2, Section 1.4.3	Meets requirements.
Out-of-Scope Requests	The referenced Section 16 was not included in the CenturyLink documentation. Please make sure that the Out-of-Scope Requests section is included in the Exhibit. **CenturyLink Response:** Corrected referenced section and added section on Out-of-Scope Requests.	AZ NG9-1-1 Technical Review 4-14-14, Section 3.1 "The following ALI to ALI steering scenarios are not covered by this Service Exhibit (see Section 16, Out-of-Scope Requests)"	Meets requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
QoS	Please update this language to state that quality of service (QoS) will be implemented across the ESInet. NENA i3 requires that IP traffic within an ESInet must implement DiffServ (RFC2475) for QoS. **CenturyLink Response:** Added new subsection to section 5.3 for QoS	AZ NG9-1-1 Technical Review 4-14-14, Section 6.2 "The CenturyLink-provided iQ MPLS private port will support QoS IP prioritization to allow the management of the prioritization of 9-1-1 voice/data/OAM network traffic"	Meets requirements.
IP Address Scheme	Please update this sentence in the Exhibit to include POPs, VIPER host sites, and VESTA host sites. **CenturyLink Response:** Added this	AZ NG9-1-1 Technical Review 4-14-14, Section 6.3 "CenturyLink will manage the IP address scheme for Next Gen 9-1-1 Routing communications through the CenturyLink iQ MPLS private port for connectivity to ECMC sites, LNG sites and PSAPs."	Meets requirements.
Next Gen 9-1-1 Routing	In the Exhibit, please clarify the meaning of the referenced section. Specifically, what does "specialized management" entail? **CenturyLink Response:** Added clarification to section	AZ NG9-1-1 Technical Review 4-14-14, Section 7.1 "Next Gen 9-1-1 Routing allows for specialized management of wireline, wireless, and VoIP call types."	Meets requirements.
	In the Exhibit, please clarify the meaning of the referenced section. Specifically, what are the CenturyLink-established preferences and needs? How would those apply to the PSAPs' flexible routing instruction rules? Is the word "instruction" needed?	AZ NG9-1-1 Technical Review 4-14-14, Section 7.1 "Next Gen 9-1-1 Routing will support flexible routing instruction rules, depending	Meets requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	CenturyLink Response: I believe this is all answered in the bullet section below this sentence Section 7.1. Also, added the below to that section below the bullet items: CenturyLink will work with PSAPs to define and manage the PSAP routing rules during the data gathering stage of the implementation. If PSAP or CenturyLink determines that changes need to be made, CenturyLink will make these changes without disruption of service. **CenturyLink Response:** Please note – see migration process as well	on CenturyLink-established preferences and needs."	
Alarm Monitoring	Please define how testing support will be provided. For example, 24x7 or 8 a.m. – 5 p.m., Monday through Friday? **CenturyLink Response:** All through this section, CenturyLink states that support is 24 hours a day, 7 days a week, and 365 days a year. Or, 366 for a leap year. This applies to the whole section on monitoring and such. However, for clarity, I added this to the sentence.	AZ NG9-1-1 Technical Review 4-14-14, Section 8.3 "CenturyLink will provide testing support when required to evaluate CPE connectivity problems."	Meets requirements.
IP Selective Router Functional Components	The components listed in this section are not IPSR components. Please update this title to "i3 Functional Elements." **CenturyLink Response:** Changed	AZ NG9-1-1 Technical Review 4-14-14, Section 12.1 Title "**IP Selective Router Functional Components"**	Meets requirements.
Emergency Call Routing Function (ECRF) and Location Validation Function (LVF)	Arizona PSAPs will migrate independently to i3 depending on their individual readiness. Please update this sentence to "PSAPs" instead of "State of Arizona." **CenturyLink Response:** Changed	AZ NG9-1-1 Technical Review 4-14-14, Section 12.1.1 "As the State of Arizona transitions from a Tabular MSAG and ESN based routing to GIS based routing,	Meets requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
		the required ECRF and LVF elements will be available."	
Border Control Function (BCF)	Border Control Functions require firewalls for data traffic and session border controllers (SBC) for voice traffic. Both data and voice traffic are part of the Managed Service. As such, "or" must be deleted from the referenced sentence. **CenturyLink Response:** Changed	AZ NG9-1-1 Technical Review 4-14-14, Section 12.1.2 "The CenturyLink solution will include Border Control Function with Firewalls (FW) and / or Session Border Controllers (SBC)."	Meets requirements.
GIS Routing	PSAPs must be able to migrate to geospatial routing independent of one another. Please update the sentence to the following: "The CenturyLink solution provides all required NENA i3 functional elements to support a GIS-based routing architecture as PSAPs are ready to move to this routing architecture." **CenturyLink Response:** Changed	AZ NG9-1-1 Technical Review 4-14-14, Section 12.1.4 "The CenturyLink solution provides all required NENA components to support a GIS based routing architecture when the STATE is ready to move to this routing architecture."	Meets requirements.
LNGs	Please add a statement to this section that commits to placing LNGs in two data centers within Arizona. **CenturyLink Response:** Changed	AZ NG9-1-1 Technical Review 4-14-14, Section 13.1	Meets requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
ESRP	Please update the second sub-bullet from "ESRT/PRF" to "ESRP/PRF." **CenturyLink Response:** Changed	AZ NG9-1-1 Technical Review 4-14-14, Section 14.3 • "Functional representation of proposed solution showing core components of the ECMC including: o LVF o ESRT/PRF o ECRF o BCF"	Meets requirements.
PSAP Equipment	Please update the section to clarify how many monitors will be provided and of what size/type, e.g., cathode-ray tube (CRT), flat-panel, 22-inch, touch screen, etc. **CenturyLink Response:** Changed	AZ NG9-1-1 Technical Review 4-14-14, Section 15.5	Meets requirements.
Headset Integration	There is no mention of whether headset integration services will be provided with the Managed Services. Please advise if headset integration service is included with the installation of PSAP equipment and end-to-end testing. If so, please include this in the Exhibit. **CenturyLink Response:** Added this to exhibit.	Not Applicable	Meets requirements. Per Task 2, MCP considers this a critical implementation item.
Training Size	Please specify the class size limit in terms of "number of attendees." **CenturyLink Response:** Added a limit of 8 per class.	AZ NG9-1-1 Technical Review 4-14-14, Section 16.2 "CenturyLink will provide (1) Agent Train the Trainer class to each new PSAP. Train-The-Trainer classes will cover all agent topics as well as tips to train the call takers specific to the PSAP. Class size is	Meets requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
		limited."	
Ad Hoc Training	Please advise if the referenced ad-hoc training is at an additional fee or is included in the Managed Services. If there is an additional fee, then what is the fee? Also, the sentence should be updated so that the word "bases" is changed to "basis." **CenturyLink Response:** Changed sentence to: CenturyLink will provide onsite technician support on ad-hoc basis, at no additional charge to PSAP, to demonstrate features for call taker supervisors	AZ NG9-1-1 Technical Review 4-14-14, Section 16.7 "CenturyLink will provide onsite technician support on ad-hoc bases to demonstrate features for call taker supervisors. This is not in lieu of formal training."	Meets requirements.
ClearView Metrics	The ClearView metrics only address IP selective router (IPSR) statistics and appear to have a gap for reporting on i3 call routing functions, data validation, text messaging, and other services included in the offering. Please advise if the Managed Services offering provides reporting on i3 call processing and data validation processes. Please specify the time zone that will be reflected in the ClearView data and how this will correlate to the unique time zone management within the State of Arizona. Will the ClearView reporting tool provide users with the ability to perform ad hoc reports and build their own metrics based on available data? Please advise if the Program will have access to these reports so that the Program may view state-level reports for all PSAPs	Clearview reports - A911	Meets requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	using the Managed Services. The Exhibit should detail the i3 call processing and data validation reporting that will be made available to PSAPs and the Program. **CenturyLink Response:** Added Intrado response to ClearView reports section.		
Overall Metrics	The Managed Services offering documentation contained only ClearView IPSR metrics. Please provide the following additional monthly metrics reports. • Network Performance Metrics o Jitter – average o MOS – low, high, average o Round trip delay – average o Packet loss – average o Downtime – seconds per month per system o Call delivery time – number of calls above 3 seconds, percent of total processed • Operational Metrics o Trouble tickets opened/closed o Trouble tickets – average duration • Call Processing and System Provisioning Metrics o See ClearView Metrics topic area above **CenturyLink Response:** Updated to new section below ClearView reports	Clearview reports - A911	Meets requirements.

3. GENERAL CLARIFICATION OF SERVICES

The following section addresses additional documentation needs of the Program. The information requested below will assist the Program in completing its assessment of the Managed Services offering, and should be considered as significant elements in determining if the solution meets the State's requirements for Next Generation 9-1-1 (NG9-1-1) services.

Table 3 – General Clarification of Services

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
Administrative Line Demarcation	Based on the description of Foreign Exchange Office (FXO), Foreign Exchange Subscriber (FXS), and T1 gateways being located at the PSAP backroom. Please provide a list of features and limitations of the administrative line solution design. **CenturyLink Response:** *Unanswered* **August 25th Update:** Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.	AZ NG9-1-1 Technical Review 4-14-14, Sections 15.4 and 7.1	Meets Requirements.
Logging Capabilities	Please provide details on the cloud-hosted logging recorder options, the features that they provide, and the associated costs, so that PSAPs may consider those options when considering the Managed Services offering. Please advise if there are any issues with state and local laws regarding retention, access and storage of communications records when using a cloud-hosted logging solution. **CenturyLink Response:** This is out of scope; however, CenturyLink is currently working with a 3rd party partner to offer a solution. **August 25th Update:** Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.	MCP Responses Set 1 sed, Answer 6 PBN-2013-Third Party IP-Recording Kit	Meets requirements. The Services Exhibit has been updated to address the feature functionality of the logging interfaces and the respective capabilities of the two call handling solutions. As the cloud-hosted logging solution is out of scope for the Managed Services offering, **MCP recommends** that the Program and/or PSAPs consider potential issues with state and local laws regarding retention, access and storage of communications records when using a cloud-hosted logging solution.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
Security	Please provide a report on the Managed Services offering's compliance with NG-SEC NENA 75-001. The report should detail what alternative preventative measures are in place to address the intent of the NG-SEC requirement for any areas where the solution is not compliant with NENA 75-001. Please describe whether there is a Security Operations Center (SOC), or a functional equivalent, that carries out the tasks above. The description should detail the hours of operation of the SOC, the metrics and reports that are monitored, and whether those reports may be made available to the Program and PSAPs. **CenturyLink Response:** NENA 75-002 is the companion document to 75-001 that provides for compliance audit to 75-001. For the 396 audit items, the below list are the ones where Intrado's InfoSec (functional equivalent to SOC) has alternate preventive measures to accomplish the goals. For audit items of 75-002 not specifically listed below, Intrado meets the comply criteria. Metric and reports are maintained audit at Intrado facilities and may be viewed in an audit process. Audit activities taking place within Intrado facilities would require prior vetting of any personnel to enter the facility. Collateral may be reviewed but must remain with the Intrado facility. Specific reports may be requested for delivery to the State, with the specific information being negotiated on award of contract. **Audit item 27 – minimum password age of 3 days** No comply. Requirement exceeded with compensating controls such as two-factor authentication. **Audit item 28 – Maximum password age requirement 60 days** No comply. Requirement exceeded with compensating controls such as two-factor authentication and account lockout after successive failed authentication attempts.	MCP Responses Set 1 sed, Answer 7	Meets requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	Audit item 34 – Passwords should not contain sequences of 3 or more char from user loginID No comply. Requirement exceeded with compensating controls such as two-factor authentication and password length and complexity enforcement. **Audit item 35 – Passwords should not contain sequences of 3 or more chars from previous pw** No comply. Requirement exceeded with compensating controls such as two-factor authentication and password length and complexity enforcement. **Audit item 36 – Passwords should not contain a sequence of 2 or more characters consecutively** No comply. Requirement exceeded with compensating controls such as two-factor authentication and password length and complexity enforcement. **Audit item 96 – administrators use non-administrative accounts when performing non-administrative tasks.** Partial comply. Remediation is in progress for known exceptions. **Audit item 97 – Do all sysadmins have a personal admin acct rather than a generic one?** Comply wherever possible. **Audit item 104 – Only administrative users are assigned passwords to access and modify sensitive files/resources.** No comply. Intrado uses Role-based Access Control (RBAC) – info owners are seldom administrators and there are non-administrators whose job function is to access and modify sensitive files/resources. Access and permissions would still be restricted. **Audit item 140 – implementation and modes shall use the strongest available product** No comply. Intrado makes the best product selection decision to meet security and business requirements of our		

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	customers, partners and established SLAs. **Audit item 368 – Wireless SSID broadcast disabled** No comply. Requirement exceeded with VPN and two-factor authentication to access internal systems. **Audit item 369 – wireless encryption** No comply. Requirement exceeded with VPN and two-factor authentication to access internal systems. **Audit item 373 – MAC address filters** No comply. Requirement exceeded with VPN and two-factor authentication to access internal systems.		
End-of-Life Equipment	The referenced diagram shows "AS5350" labeling of a gateway icon at the Phoenix and Tucson LNGs (far left boxes), with ingress to the box via multiple DS1s and direct connectivity into (Cisco) 3945 routers. This design leaves MCP with the understanding that the LNG gateways are Cisco AS5350 Universal Gateways. In its research, MCP found that these gateways were put on end-of-life notice in 2006, with the last date of support being December 21, 2011. This leaves MCP to believe that these could possibly be Cisco AS5350XM Universal Gateways, which are also under end-of-life notice, but with a last date of support being February 28, 2018; however, Cisco is no longer providing software maintenance support as of February 2014. This research elicits several areas of concern: 1. What is the actual device providing the gateway function at the LNGs? 2. If the device is under an end-of-life notice, then does the device have a current service contract? How long until the service contract expires? 3. What is the process for introducing new hardware, software and firmware to the solution design? 4. What is the migration plan to replace these devices prior to the expiration of the service contract?	NG911 Managed Services - Arizona Network Diagram	Meets Requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
	5. What other devices not labeled in the diagram are also under an end-of-life notice? If applicable, what do their service contracts and replacement schedules look like? Please provide answers to each of these questions. **CenturyLink Response:** **1. What is the actual device providing the gateway function at the LNGs?** >>Cisco AS5350XM **2. If the device is under an end-of-life notice, then does the device have a current service contract? How long until the service contract expires?** >>Current support contract runs through 9/29/15, which is the published end-of-support date. **3. What is the process for introducing new hardware, software and firmware to the solution design?** >>Alternative devices are introduced and tested via interoperability testing in the Intrado Lab. **4. What is the migration plan to replace these devices prior to the expiration of the service contract?** >>After devices have been tested for functionality against the pre-production instance in the Intrado Lab a project schedule will be published to get current infrastructure replaced and new models deployed to new opportunities. **5. What devices will we use at the LNG to replace the Cisco EOL\EOS equipment in previous drawings (i.e., AS5000, 2800 series routers, etc.)** >>The Gateways are open for definition as multiple devices will be tested to confirm their ability to function within the		

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	solution. The Cisco routers (2800's) will be replaced by the newer generation hardware that is already being installed for new deployments. **What domain name will be used for the element in the ESiNet, or will customer have feedback on this?** >>A CLLI is obtained for each functional instance at an LNG from Telcordia. **August 25th Update:** Resolution negotiated between the State 9-1-1 Program Office and CenturyLink.		
Network Design	Please advise if encryption will be implemented across the network and if so, please advise what protocol(s) and network design considerations are being made to secure the data. **CenturyLink Response:** RTP is not specifically encrypted to the user; however; transport between devices over IP access clouds is encrypted using standard IPSEC (AE256) tunneling.	AZ NG9-1-1 Technical Review 4-14-14, Sections 6.2, 13.5.2, 13.6.2, 13.7.5	Meets requirements.
Shared 3-Digit Bridge Lists	Please confirm that the referenced section indicates that this is a future feature. If so, please provide a committed timeline for the delivery of this feature. **CenturyLink Response:** Shared 3-Digit Bridge List is a confirmed future feature, included at no additional charge, and set for mid-2015 roadmap. This functionality is contingent on each CPE providing the 3-digit dialing information to the network	AZ NG9-1-1 Technical Review 4-14-14, Section 7.2 "**Shared 3-Digit Bridge Lists**: The ability for the call taker to use a single button on the call taker's display and transfer unit to complete either a transfer or three-way conference. These transfers utilize pre-provisioned Star Codes (*200-*999). These Star Codes will be shared among numerous PSAPs (i.e., all	Meets requirements.

Topic Area	Commentary	Reference	Phase II, Task 4 Commentary
		PSAPs in a particular State could use the same Star Codes). In order to match the functionality that CenturyLink has deployed within its region, CenturyLink will develop this capability as part of the Product Roadmap."	
I to I process	Please define the "I to I process" as it pertains to the Program and/or Arizona PSAPs. **CenturyLink Response:** The I to I process in an Intrado internal process that does not engage the State or PSAPs. Requests for additional or customized reports, query capabilities, and graphical data display should be made through standard CenturyLink customization/change order processes.	AZ NG9-1-1 Technical Review 4-14-14, Section 9.9 "Requests for additional or customized reports, query capabilities, and graphical data display should be made in accordance with the I to I process."	Meets requirements.