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April 11, 2014

VIA ECFS

Marlene H. Dortch, Secretary
Office of the Secretary
Federal Communications Commission
445 12th Street, N.W.
Washington, DC 20554

Re: Iowa Network Services, Inc. – Notice of Ex Parte Meeting
Technology Transitions, GN Docket No. 13-5

Dear Ms. Dortch:

On April 9, 2014, James Troup and Tony Lee of Fletcher, Heald & Hildreth, and Ronald Keller – President & CEO, Michael Eggley – Chief Operating Officer, Dennis Creveling – Chief Financial Officer, Bob Sherlock – Vice President of Engineering, Leon Hofer – Vice President of Network Operations, and Frank Hilton – Vice President of Information Management, of Iowa Network Services, Inc. ("INS") (all INS personnel participating via teleconference), met with FCC staff to discuss INS' proposed TDM-to-IP transition experiment for centralized equal access ("CEA") service. The following Commission staff members attended the meeting: Pamela Arluk (WCB-PPD), Matthew DelNero (WCB), Kalpak Gude (WCB-PPD), William Layton (WCB-PPD), Thomas Parisi (WCB-PPD), Jonathan Reel (WCP-CPF), Deena Shetler (WCB-PPD), and Tim Stelzig (WCB-CPD).

During the meeting, INS distributed the attached handout to staff. As set forth in the handout, INS provided additional details regarding the three phases of INS' proposed experiment, and the collection of objective and subjective data. With regard to the data to be collected, INS informed staff that objective mean opinion score measurements would be taken during all phases of the experiment on an end-to-end basis to determine the impact of the IP transition on all parts of the network. Objective data would be collected during all phases of the experiment, and subjective survey data on call quality would be collected on a quarterly basis by an independent third party commissioned to conduct such surveys. INS also relayed to staff that its network would need to be upgraded for the experiment by purchasing additional licenses from its switch manufacturer to enable the IP functionality of its switch. INS also stated that it anticipated that participating carriers would likely need to undertake similar upgrades in order to participate in the trials. INS clarified that the points of interconnection with the LECs would not need to be moved for the experiment.

Staff asked what rates INS would charge carriers for participating in the IP CEA experiment, and whether INS would consider charging a different rate for IP service. INS responded that, because of the requirement to maintain the status quo ante in the *Technology Transition Order*,[1] INS would charge the same rate for CEA service for IP traffic as it does for TDM traffic. Consequently, the INS IP experiment would not second-guess the policy question currently pending before the Commission asking "Are there any potential negative consequences for having different prices for TDM and IP interconnection?"[2] Furthermore, because carriers would participate in the experiment on a voluntary basis, INS would enter into contracts with those carriers for IP CEA service, which would be provided under the same tariff rates as that applicable to TDM service. Both TDM and IP traffic would be charged the same rate on a per minute basis, regardless of the amount of traffic sent to INS for routing to rural local exchange carriers ("LECs"). INS stated that it believed that this would be the best approach to maintain the status quo ante because substantially similar facilities would be used to transport both TDM and IP traffic. Moreover, such an approach would also avoid potential accusations that INS violated its common carrier obligations by discriminating against carriers by charging different rates for providing the same service over substantially similar facilities.

Staff also inquired as to the amount of interest other carriers have expressed in participating in INS' experiment, and the authority INS believed it needed from the FCC in order to conduct the experiment. INS reported that two VoIP carriers had expressed interest in being included in the experiment by interconnecting with INS on a one-way basis. None of the larger interexchange carriers ("IXCs") have indicated that they will take part in the experiment. With respect to interconnection arrangements for VoIP traffic, the Commission has recognized that such recalcitrance can occur when there is "disparate negotiating leverage" and "absent an appropriate regulatory backstop."[3] However, INS will contact those IXCs to determine if any of them would be interested in participating. INS does not believe that it will have difficulty with garnering consumer or LEC participation in the experiment.

INS further stated that while it believed that the Section 214 authority granted to INS in 1989 was broad in scope and did not limit CEA service to any particular protocol (whether IP or TDM),[4] the *Technology Transition Order* establishing the framework for service-based IP experiments indicated that INS should apply for authority from the Commission to conduct the experiment. Furthermore, as permitted by paragraph 960 of the *Connect America Order*, INS'

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[1] *In re Technology Transitions et al.*, Order, Report and Order, and Further Notice of Proposed Rulemaking, GN Docket No. 13-5, FCC 14-5 ¶ 36 (rel. Jan 31, 2014) ("*Technology Transitions Order*").

[2] *In re Connect America Fund et al.*, 26 FCC Rcd 17663, 18137 ¶ 1373 (2011) ("*Connect America Order*")

[3] *Connect America Order*, 26 FCC Rcd at 18024 ¶ 966.

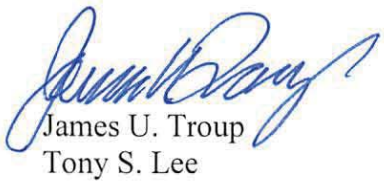
[4] *See Application of Iowa Network Access Division for Authority Pursuant to Section 214 of the Communications Act of 1934 and Section 63.01 of the Commission's Rules and Regulations to Lease Transmission Facilities to Provide Access Service lo lnterexchange Carriers in the Stale of Iowa,* Memorandum Opinion, Order and Certificate, 3 FCC Rcd 1468 (1988), *aff'd on recon.*, 4 FCC Rcd 2201 (1989); *Iowa Network Access Division, Division of Iowa Network Services,* Iowa Utilities Board Docket No. RPU-88-2, 1988 Iowa PUC LEXIS 1 (1988), *aff'd on appeal, N.W. Bell Tel. Co. v. Iowa Utils. Bd.*, 477 N.W.2d 678, 681 (Iowa 1991).

tariff already applies the CEA rates to toll VoIP-PSTN traffic.[5] The *Technology Transition Order* provided additional impetus for INS to take actions to assess the impact of IP-based technologies on the CEA services it provides because IP CEA could be provided on a limited experimental basis while maintaining the status quo ante. INS expressed concern that any policy-changing conditions imposed on its IP experiment that altered the status quo ante could render the experiment unworkable, which could force INS to withdraw its application.

INS indicated to staff that because INS does not control the entire network path, and only provides the intermediate switching and transport functions needed to connect IXCs to rural LECs, additional authority from the FCC may be required for INS to manage reporting for the LECs' portion of the trial in phase 3 of the experiment. Such authority would be similar to that granted by the FCC in the wireless context where licensees can use leases or management agreements to allow others to manage their spectrum. In approving INS' proposed experiment, the FCC could grant INS temporary management of testing and reporting for the LECs' portion of phase 3 of the experiment that INS does not have today because INS is not a LEC, and INS' Section 214 authority did not contemplate INS exercising such operational involvement with local exchange service during the provision of CEA. Such temporary authority for the oversight of testing and reporting relating to local exchange service would terminate at the end of the experiment.

Should you have any questions with respect to this matter, please feel free to contact us at (703) 812-0400.

Sincerely,



James U. Troup
Tony S. Lee

Counsel for Iowa Network Services, Inc.

Enclosure

cc: Pamela Arluk (WCB-PPD)
Matthew DelNero (WCB)
Kalpak Gude (WCB-PPD)
William Layton (WCB-PPD)
Thomas Parisi (WCB-PPD)
Jonathan Reel (WCP-CPF)
Deena Shetler (WCB-PPD)
Tim Stelzig (WCB-CPD)

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[5] INAD Tariff F.C.C. No. 1, 4th Rev. Page 88.

Iowa Network Services, Inc.

Proposed TDM-to-IP Transition Experiment for CEA Service

April 9, 2014

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INS Executives Meeting with FCC

- Ronald Keller, President and Chief Executive Officer
- Michael Eggley, Chief Operating Officer
- Dennis M. Creveling, Chief Financial Officer
- Bob Sherlock, Vice President of Engineering
- Leon D. Hofer, Vice President of Network Operations
- Frank Hilton, Vice President of Information Management

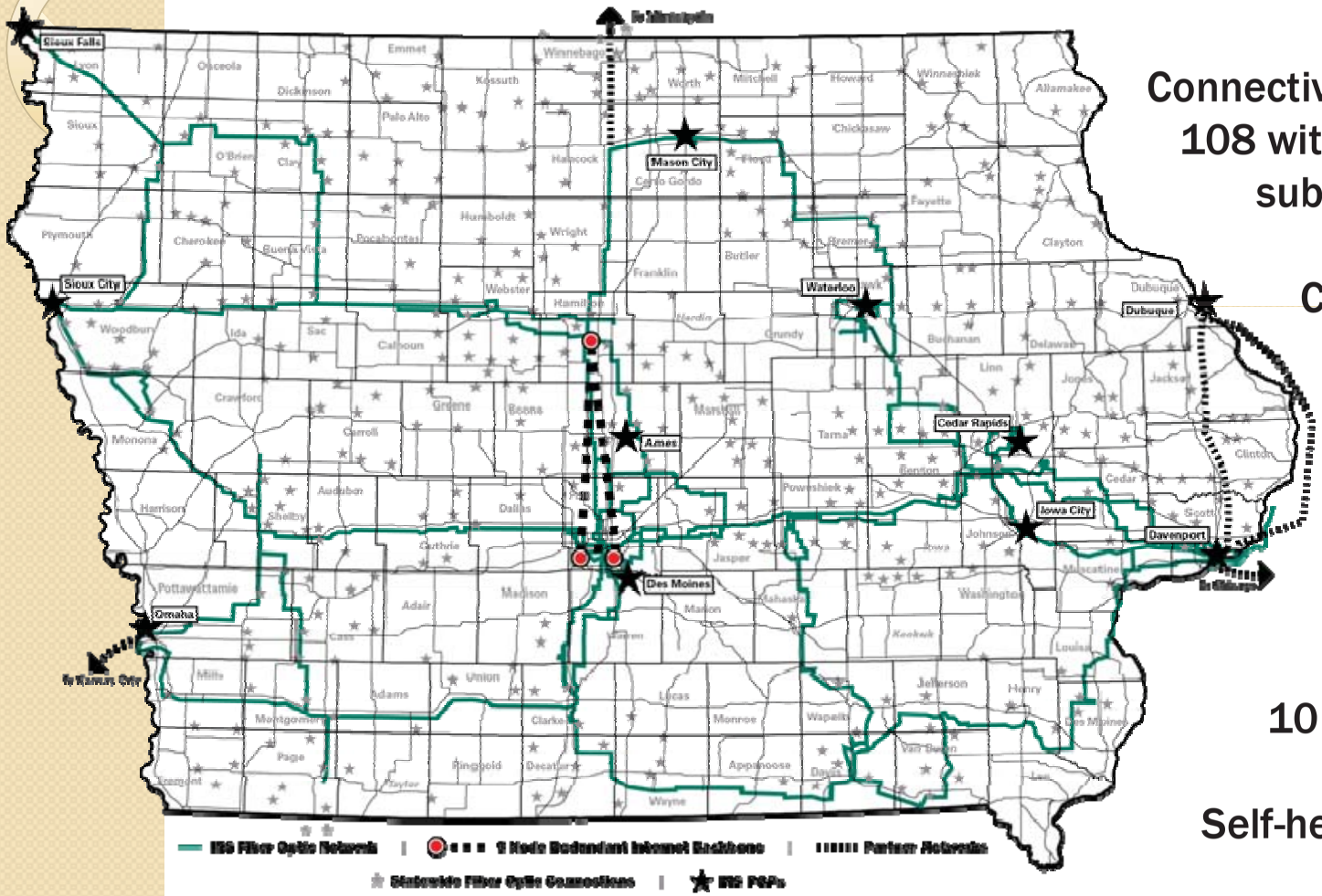
Centralized Equal Access (CEA)

- What is CEA?
  - CEA is the ability to give rural consumers the choice of LD providers (EA) from a centralized location without forcing every Rural LEC to implement the costly upgrades needed to support that initiative.

Background of INS' CEA Service

- Prior to the creation of INS, AT&T had an interLATA toll monopoly, and NW Bell Tel. (now CenturyLink) had an intraLATA toll monopoly in rural Iowa
- CEA provides rural residents with a choice of long distance carriers by centralizing equal access functionality and concentrating rural traffic sufficiently to make rural areas attractive for competitive carriers to serve
- INS' fiber optic network provides a bridge between nearly all rural Iowa LECs and other carriers, such as IXCs, CMRS providers, and CLECs

INS Fiber Optic Network



Connectivity for 150 ITCs
108 with less than 1000 subscribers

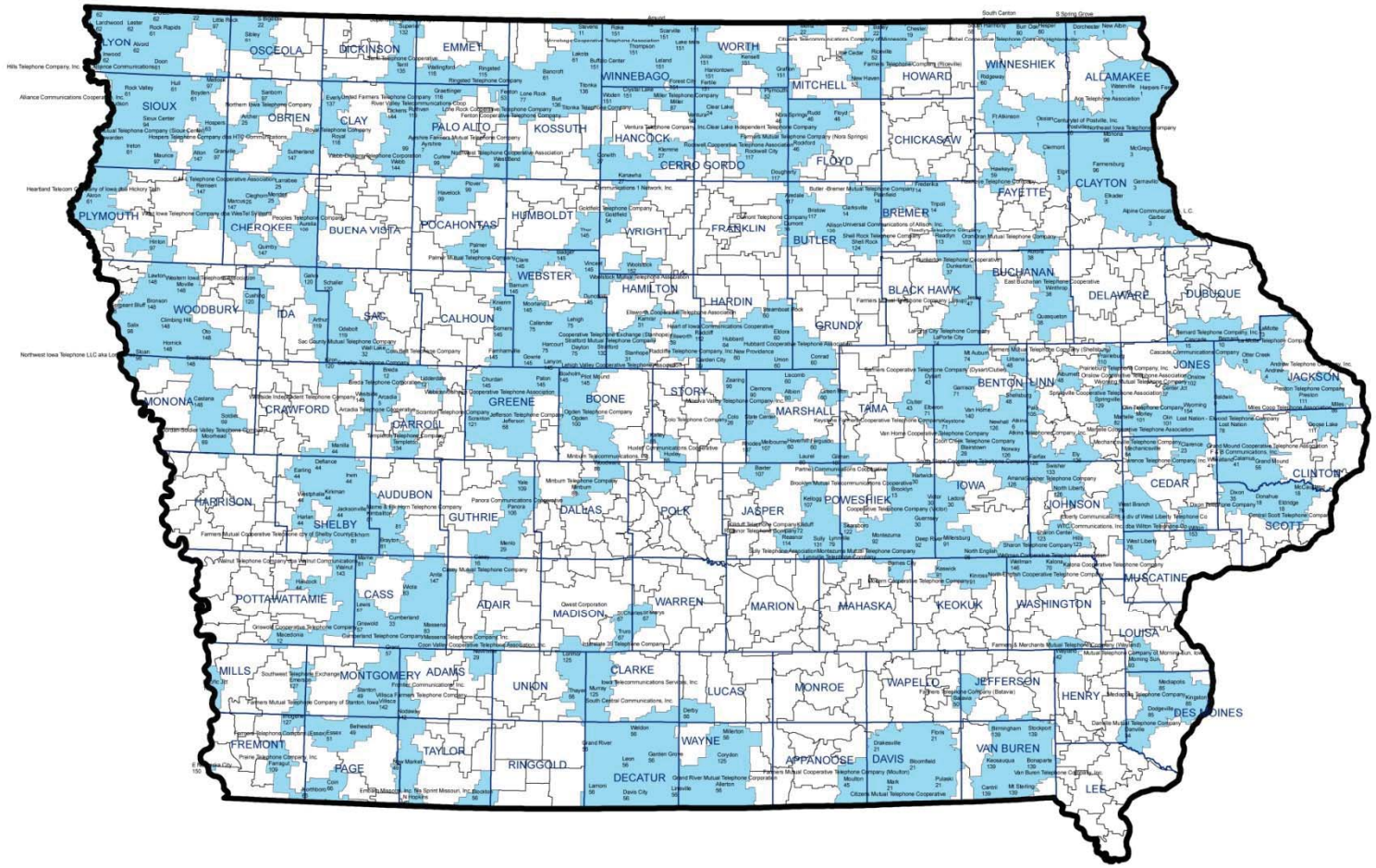
Collectively serve over 300,000 customers in 330 Communities

5,500+ miles of Fiber Routes

10 Gigabit Capacity

Self-healing Architecture

Independent Telephone Companies (in blue)



Need for CEA in an All-IP World

- Customer Choice
  - CEA will preserve customers' choice of providers by enabling IP service providers to connect to rural areas in Iowa
- Solves problem of isolation of customers
  - Too many rural Iowa towns can be isolated by a fiber cut
  - Local cell towers often share the towns fiber
  - Current Internet phone service options will not work when a town is Isolated
- Service quality
  - Dedicated facilities connecting carriers to INS' network provide higher quality of service than that over the open Internet.

Need for CEA in an All-IP World

(Cont'd)

- IP traffic still needs a pathway to and from rural areas in Iowa.
- Current proposal by AT&T, and as supported by Sprint, CenturyLink, and Verizon, envisions the use of a few distant geographic points of interconnection (POI) for the exchange of IP traffic, with carriers responsible for hauling their own traffic to the POIs for exchange with other carriers.
- Small carriers simply do not have the capability and cannot afford to build long-haul facilities to a handful of distant IP POIs.

Current Network Configuration

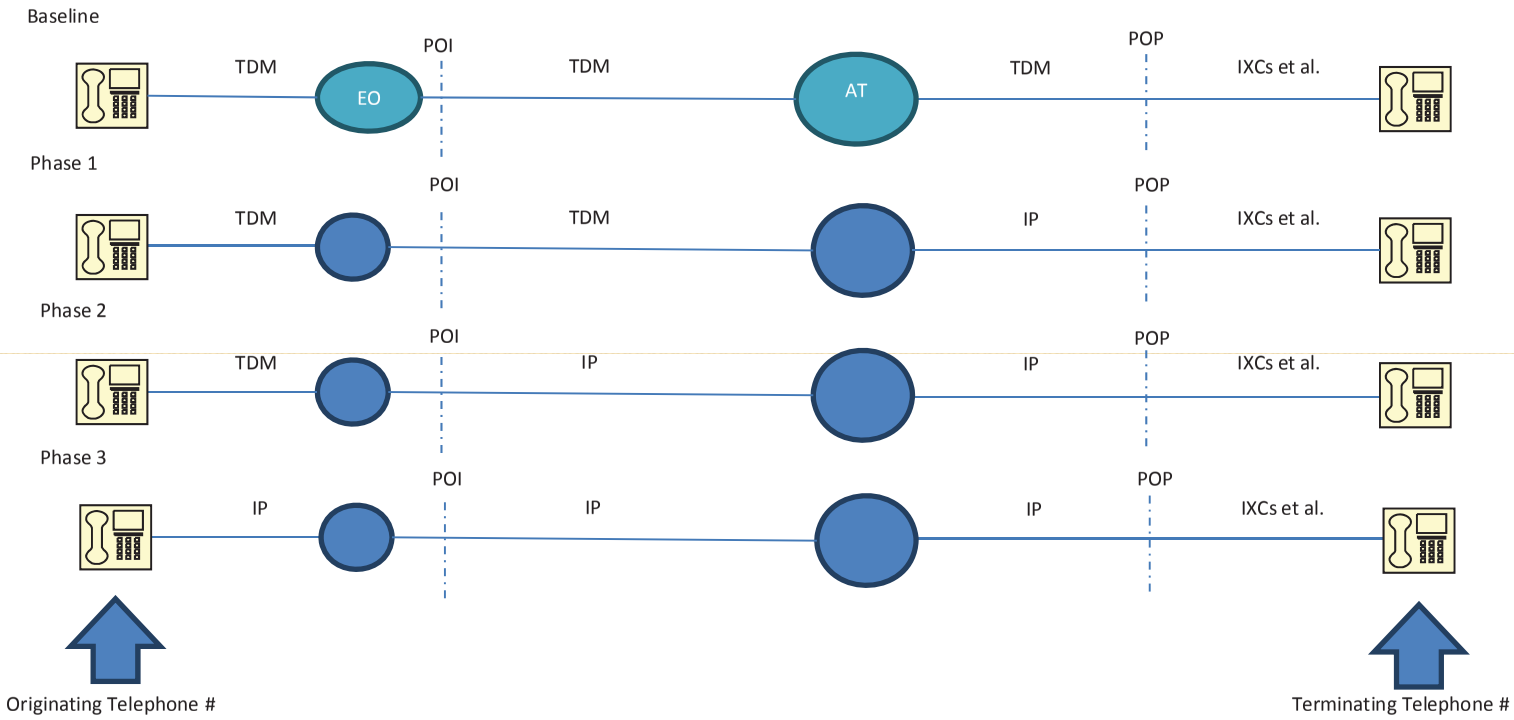
- Currently, traffic is routed by IXCs and other carriers to INS, and connect to INS' tandem switch via TDM facilities.
- Trunks to the independent telephone companies ("ITCs") are fiber optic lines that hand off traffic to the ITCs at the POI. There is no change in the format of the communications at the POI, i.e., it remains in TDM format.

Current Network Configuration

(Cont'd)

- ITCs take the traffic from INS at the POI, and terminates calls to end users.

INS' Proposed IP Experiment



- Experiment will be conducted in three phases, with measurements taken at the baseline (before start of the experiment), and at the completion of each phase to collect meaningful data on the impact of the use of IP technology on each segment of the network.

INS IP Experiment – Phase I

- Phase 1: IP to TDM conversion at tandem
  - Solicit voluntary participation by IXCs, wireless carriers, VoIP providers, and CLECs
  - No network upgrades would be required for INS' CEA network. Its switch is capable of handling IP traffic via SIP ports/trunks, though no carriers currently interconnect with INS via SIP trunks.
  - Upgrades may be needed by participating carriers to send IP traffic to INS' switch
  - IP traffic would be converted to TDM at INS' switch, and handed off to LECs at the POI

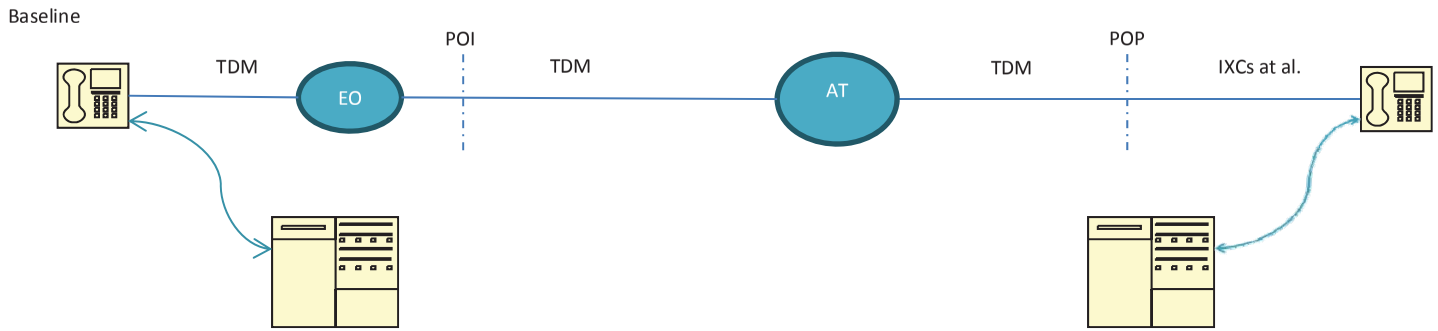
INS IP Experiment – Phase 2

- Phase 2: Transport of IP traffic to the POI
  - IP traffic would remain in IP format until the POI or the CO, depending on the LECs' network configuration.
  - At the POI or the CO, traffic would be converted to TDM and then routed for termination
  - No upgrades of INS' network would be required as INS' fiber network will transport traffic to the POI in whatever form it is in when transmitted
  - No additional upgrades are anticipated with the LECs in order to handle the IP to TDM conversion

INS IP Experiment – Phase 3

- Phase 3: End-to-End All-IP Facilities
  - INS would ask for the voluntary participation of IXCs, LECs, and end users
  - LECs would need to have in place customer premises equipment to enable end users to place calls using the all-IP network.
    - For FTTH: Optical Network Terminal
    - For copper local loop: DSL modem with separate IP conversion unit connecting to inside wiring (could involve VoIP telephone)

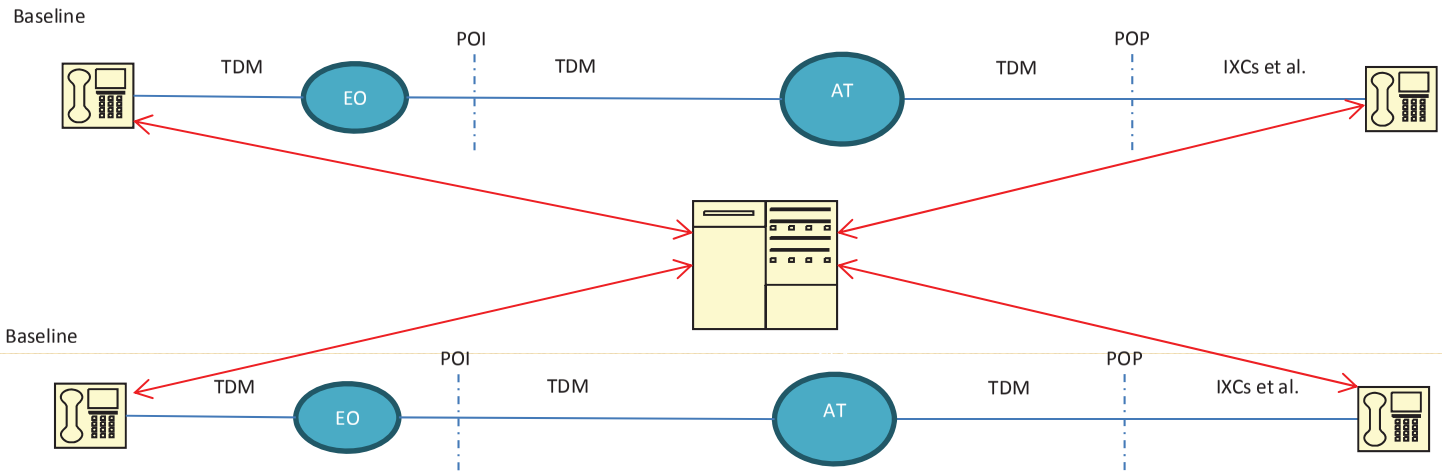
Methodology for Data Collection



- Data will be collected using a test set connected at both ends of a test circuit.
- Example: Use of a Sage 935 test set to measure Mean Opinion Score
- Possibility to expand geographically to include remote test probes

Methodology for Data Collection

(Cont'd)



- Additional potential option for data collection:
  - Data would be collected using a centrally located test platform gathering data from probes connected at both ends of test circuits

Objective Data to be Collected

Technical Parameters that Impact Speech Quality (MOS)

- Echo
  - In VoIP networks, the echo problem is aggravated because of the extra delay introduced by compressive codecs and packet networks.
- Network Latency
  - Too much network latency can disrupt the normal flow of conversation
    - Primary sources of delay: voice processing, packetizing, and jitter-buffer
- Voice Clarity
  - Can be tested using artificial voice signal built into test platforms
- Circuit Loss
  - Must balance loss to attenuate echo, while maintaining audible levels for conversation
- Comfort Noise
  - Noise that is inserted during silent periods to make conversations sound more natural, and more similar to a normal voice call. Too much comfort noise sounds like a bad connection, too little sounds like a dead or dropped call.

Objective Data to be Collected

(Cont'd)

- Packet Loss
  - Can be caused by:
    - Late Packet Arrival
    - Misrouted Packet
    - Packet Error
- Voice Packet Jitter/Jitter Buffer Resizing
- Codec Type
- Effective Bandwidth
- Call Completion Time
  - Measures elapsed time from last dialed digit to detection of answer on terminating end

Objective Data to be Collected

(Cont'd)

- Sample Data Output:

```
--------------- SMOS REPORT ---------------
DURATION:    9s
SEND TLP:  +0.0            RECV TLP:  +0.0

NF_MOS: 4.56               FN_MOS: 4.55
NF_NOISE: 24dBrnC          FN_NOISE: 24dBrnC
NF_+FS: 0mS                FN_+FS: 0mS
NF_-FS: 0mS                FN_-FS: 0mS
NF_BW: 99.0%               FN_BW: 98.5%
NF_GAIN: +0dB              FN_GAIN: +0dB
NF_CODEC: PCM              FN_CODEC: PCM
DELAY: 0.0mS
```

Subjective Data to be Collected

- Validation of 911
  - Call quality
  - 911 Functionality, e.g., caller location
  - Will work with PSAPs to ensure continuity of 911 service for customers
- General Trouble Problems
  - Will gather trouble reports and opinions from customers not collected by the test platforms

Regulatory Issues

- Geographic Scope of Experiment
  - Would be limited to the exchanges of the participating carriers
- Maintenance of the State Quo Ante
  - INS will charge the same rates for CEA service during the experiment as it does now
  - Rates are charged on a per minute basis regardless of the capacities ordered
- Retention of Customer Choice of Competitive Carriers Through IP Equal Access
  - Transport will still be needed to connect customers in rural areas to carriers of their choice, as well as to the Internet

Considerations Regarding Impact on Existing Services

- Emergency Services
  - Will work with first responders to ensure the experiment does not adversely affect emergency communications
- Customer Choice
  - Will work to ensure that customers can continue to use carriers of their choice for presubscribed services, dial around, and pre-paid calling cards
- Current Services
  - Will work with all participants to ensure that current services are not disrupted by the trials

Considerations Regarding Persons with Disabilities

- Objective: Determine whether transition to an all-IP network will adversely impact the communications needs of persons with disabilities (e.g., TRS, TTY, RTT)
  - Will reach out to groups representing the needs of persons with disabilities for input on tests that should be performed during the experiment
    - Groups that may be contacted include:
      - National Association of the Deaf
      - National Federation of the Blind
      - American Association of People with Disabilities
      - Hearing Loss Association of America
      - Telecommunications for the Deaf and Hard of Hearing, Inc.
      - Rehabilitation Engineering Research Center on Telecommunications Access

Post Experiment Evaluation

- Data and results of the experiment will be provided to the FCC for use in considering legal, policy, and technology issues associated with transitioning to an all-IP network
- Experimental data will also be provided to industry groups, such as ATIS, for use in developing industry standards for IP networks