

# Texting to 9-1-1

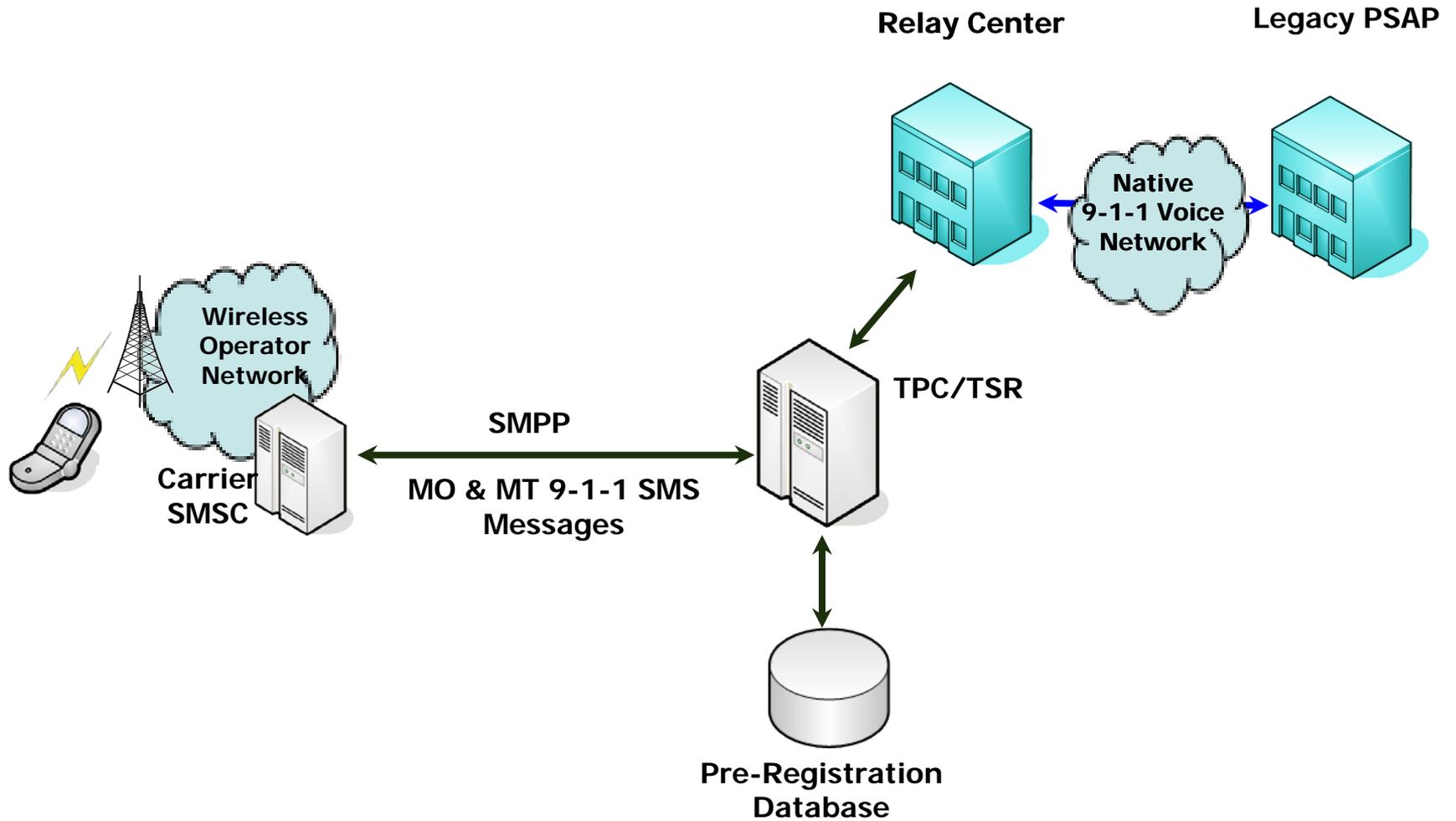
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Intrado Inc. (revised 2-6-12)

- Intrado's deployment vision
- Options for delivering text messages to legacy PSAPs
- Standards required for text to 9-1-1
- Costs

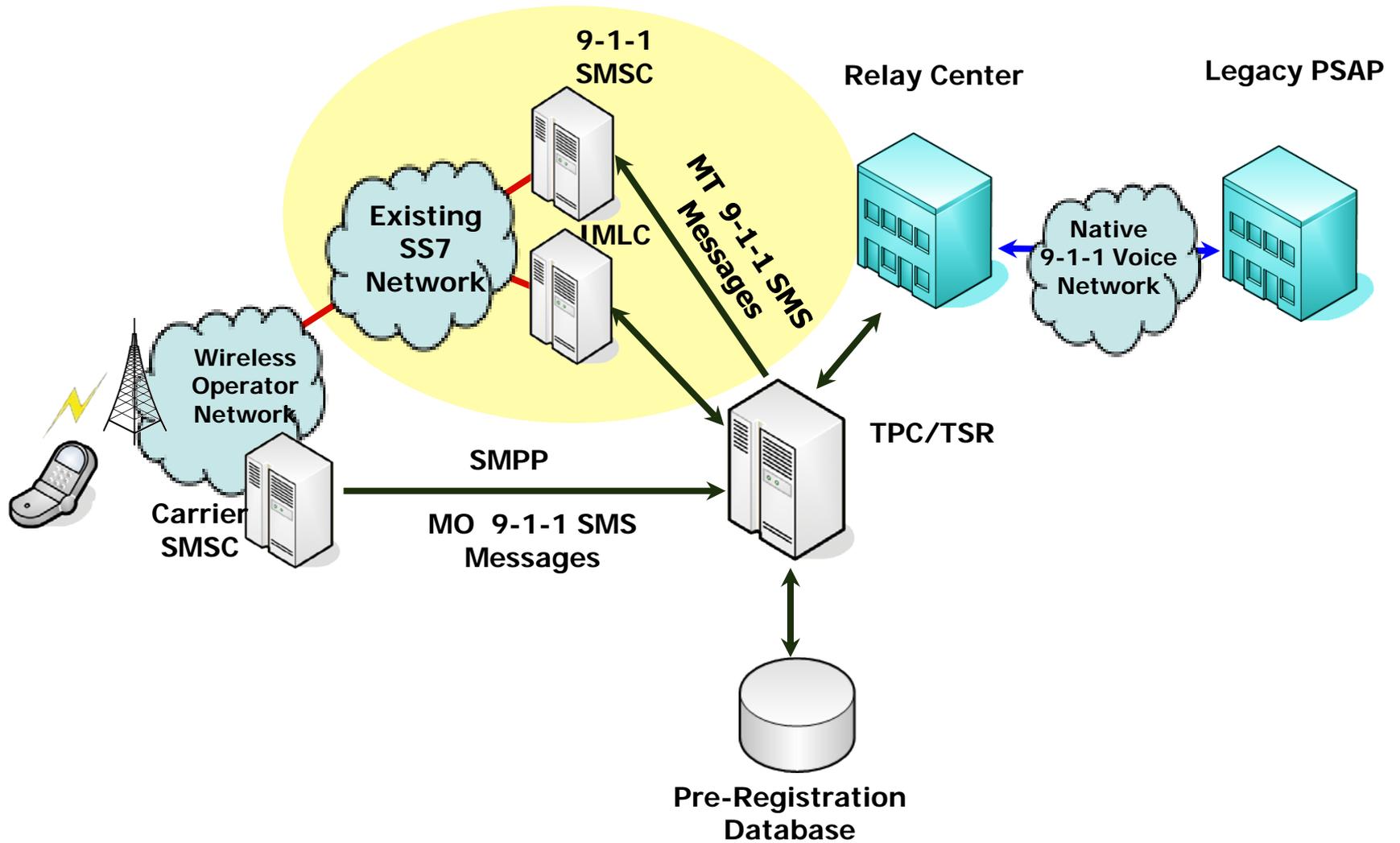
# Stage 1a - SMS Relay Center (Initial Deployment)



## Stage 1a - SMS Relay Center (Initial Deployment)

- Timeframe:
  - Could be deployed in as little as 3 months from today
- Requirements:
  - Carrier connect direct SMMP binds or through existing SMS Hub provider
- Additional Cost Elements:
  - SMS relay renter and native voice network
- Supports:
  - Nationwide support for persons with disabilities texting to 9-1-1
- Limitations:
  - Would only support persons with disabilities
  - Registration required. Persons with disabilities are required to pre-register through SMS short code, web site or dynamic registration
  - No location. SMS relay center would have to ask for location
  - Reduced reliability. Without 9-1-1 SMSC, SMS messages could be delayed or lost

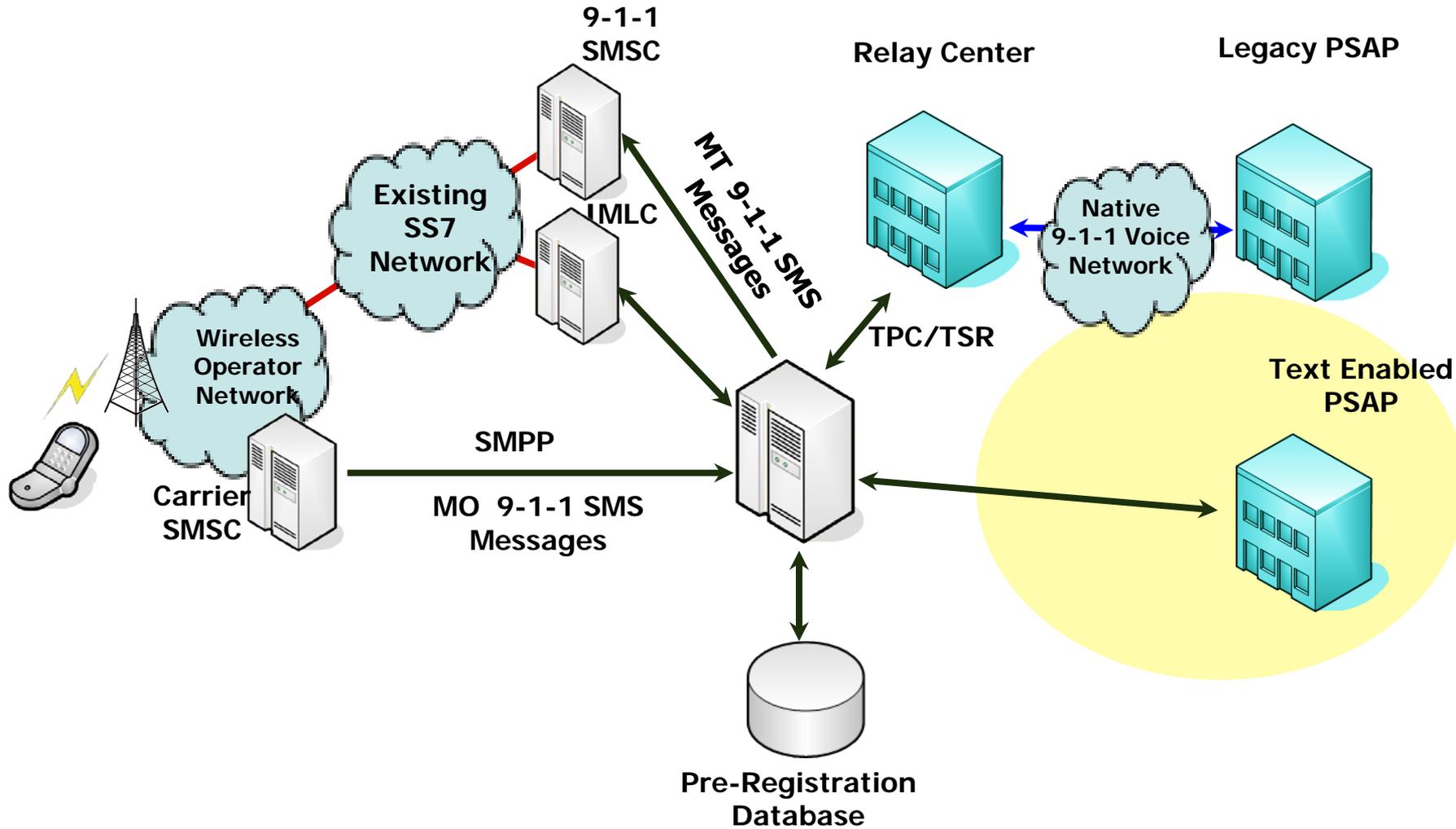
# Stage 1b - SMS Relay Center (Enhanced Deployment)



## Stage 1b - SMS Relay Center (Enhanced Deployment)

- Timeframe:
  - Due to SS7 integration and SMPP circuits, could be deployed in 3-12 months from today
- Additional Requirements:
  - Create direct SMPP bind to route MO traffic to TPC
  - Configure permissions on HLR, MSC and STP to allow IMLC to query for location
  - Configure permissions on HLR, MSC and STP to allow 9-1-1 Message Center (9-1-1 SMSC) to send messages
- Additional Cost Elements:
  - SMPP bind circuits
  - TPC (or carrier's existing), 9-1-1 SMSC (or carrier's existing)
- Supports:
  - Nationwide support for persons with disabilities texting to 9-1-1
  - Automatic cell location to select proper PSAP
  - Enhanced SMS delivery to reduce delay and prevent message loss
- Limitations:
  - Would only support persons with disabilities
  - Registration required. Persons with disabilities are required to pre-register through SMS Short code, web site or dynamic registration
- Elements No Longer used
  - Shared SMPP bind to SMS Hub provider

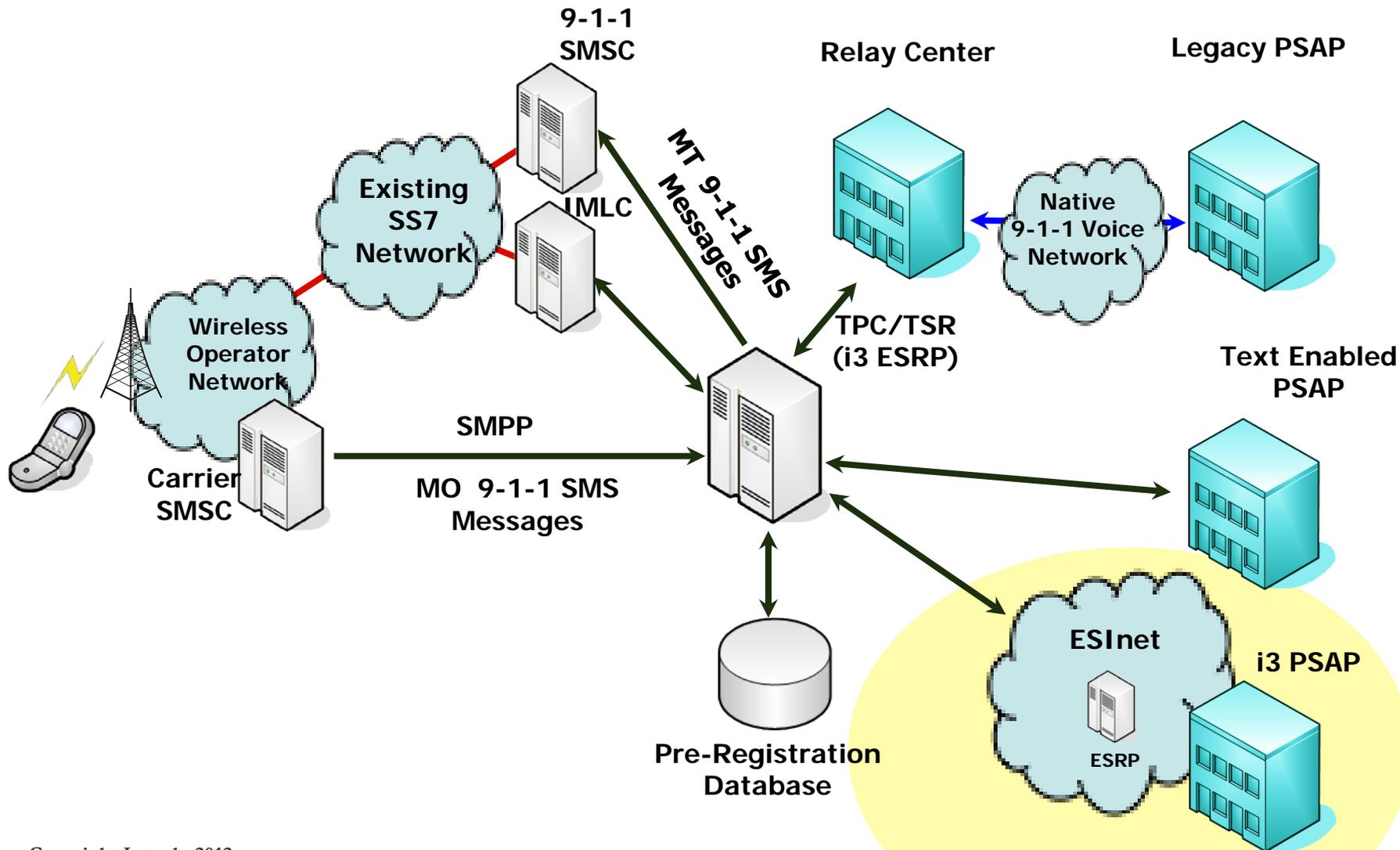
## Stage 2 - Direct Routing (Pre i3 PSAPs)



## Stage 2 - Direct Routing (Pre i3 PSAPs)

- Timeframe:
  - Same as Stage 1b. Requires no changes to carrier's network
  - Existing text enabled PSAPs (e.g. Durham and Black Hawk)
- Requirements
  - Stage 1b elements deployed
- Additional Requirements:
  - None
- Additional Cost Elements:
  - None
- Supports:
  - Direct routing to text enabled PSAP for all text-to-911 messages. Pre-i3 solutions will evolve to i3 solution
  - Nationwide support for persons with disabilities texting to 9-1-1
  - Automatic cell location to select proper PSAP
  - Enhanced SMS delivery to reduce delay and prevent message loss
- Limitations:
  - Registration required. Persons with disabilities are required to pre-register through SMS Short code, web site or dynamic registration to reach the relay center where no direct PSAP is available
- Elements No Longer Used
  - NONE - All elements from previous stages used

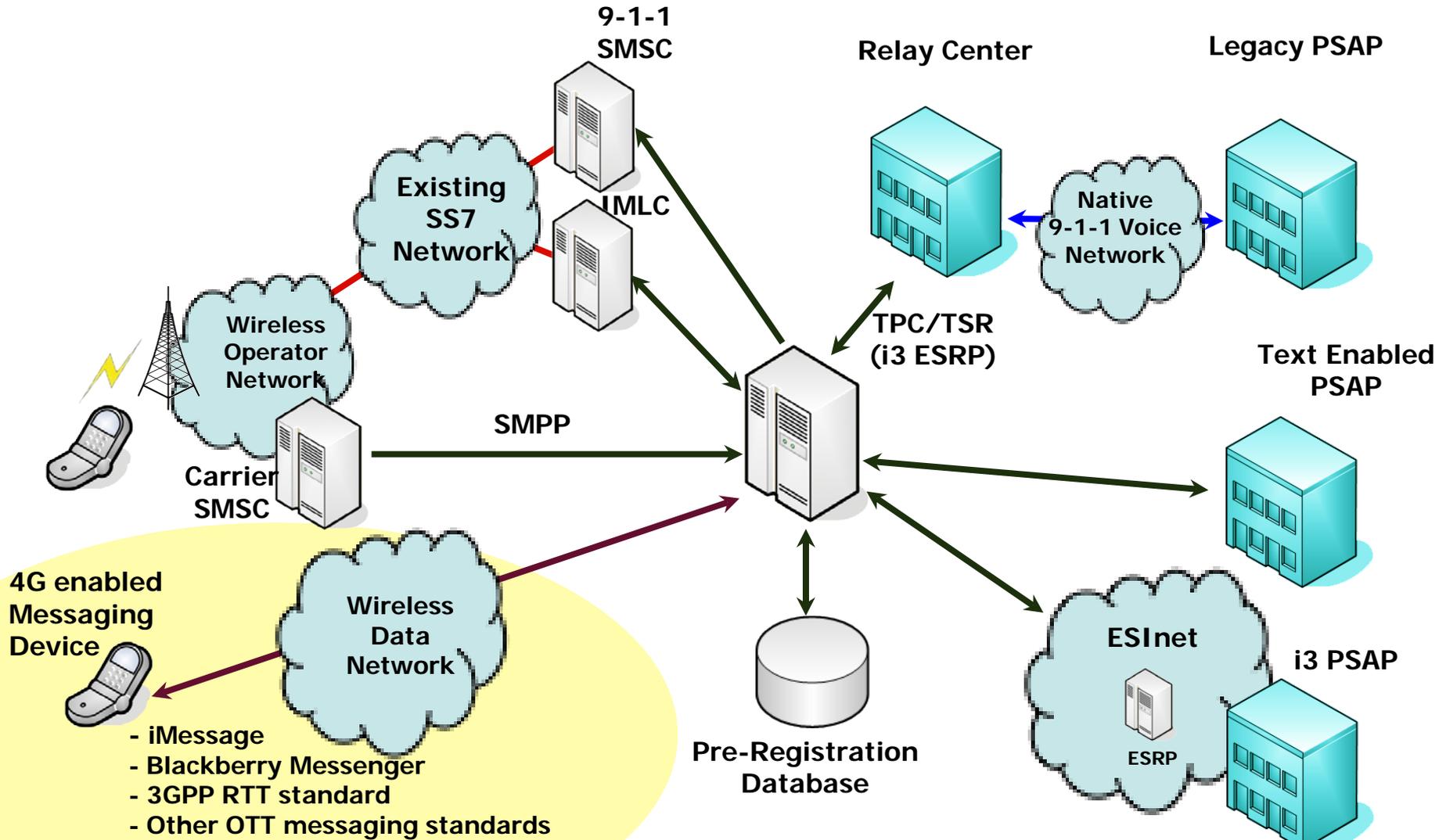
## Stage 2 - Direct Routing (i3)



## Stage 2 - Direct Routing (i3)

- Timeframe:
  - Same as Stage 1b. Requires no changes to carrier
  - Expect initial PSAPs to be ready in 6+ months from today
- Requirements:
  - Stage 1b elements deployed
- Additional Requirements:
  - None
- Additional Cost Elements:
  - None
- Supports:
  - Direct routing to text enabled PSAP for all text-to-911 messages
  - Nationwide support for persons with disabilities texting to 9-1-1
  - Automatic cell location to select proper PSAP
  - Enhanced SMS delivery to reduce delay and prevent message loss
- Limitations:
  - Registration required. Persons with disabilities are required to pre-register through SMS Short code, web site or dynamic registration to reach the relay center where no direct PSAP is available
- Elements No Longer Used
  - NONE - All elements from previous stages used

# Stage 3 - Other Messaging Protocols



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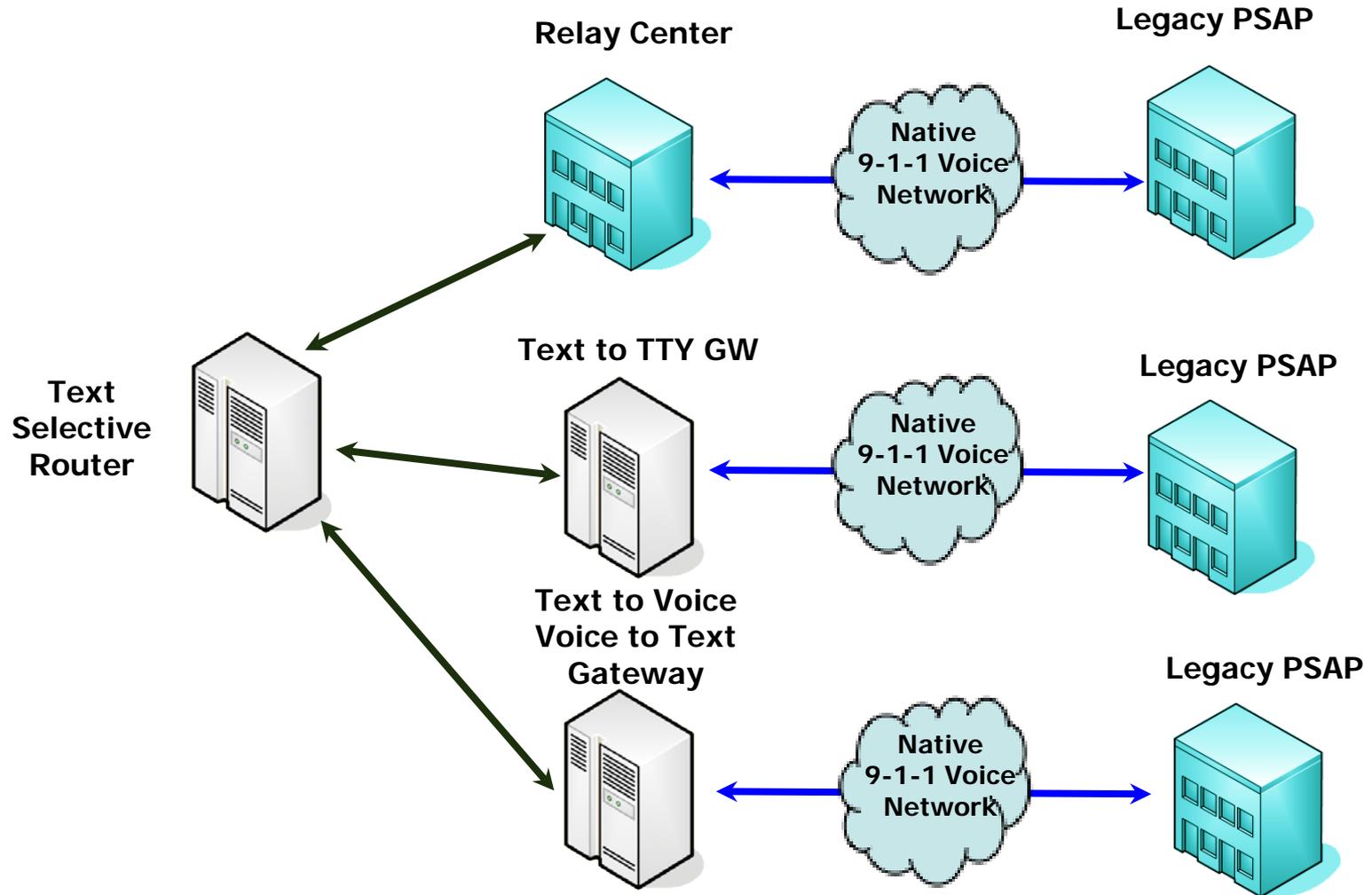
- Timeframe:
  - Once Stage 1b is in place and as messaging protocols are deployed
- Requirements
  - Stage 1b elements deployed
- Additional Requirements:
  - Connect messaging service into TSR
- Additional Cost Elements:
  - Connectivity of additional messaging services
- Supports:
  - X/Y location if supported by messaging protocol
  - Direct routing to text enabled PSAP for all text-to-911 messages
  - Nationwide support for persons with disabilities texting to 9-1-1
  - Automatic cell location to select proper PSAP
  - Enhanced SMS delivery to reduce delay and prevent message loss
- Limitations:
  - Registration required. Persons with Disabilities are required to pre-register through SMS Short code, Web site or dynamic registration to reach the relay center where no direct PSAP is available
- Elements No Longer Used
  - NONE - All elements from previous stages used

- Elements of SMS Relay will exist until all PSAPs are text enabled
- SMS in the US will remain even after deployments of RTT and 4G
- The current Text to 9-1-1 deployments by Intrado are scalable
- Intrado currently has the capability to process all of the SMS to 9-1-1 calls from connected carriers
  - Receive the 9-1-1 SMS
  - Locate the serving cell of the SMS Texter
  - Route to text enables PSAP or return an “out of area” message to texter
- All current PSAP deployments have an evolutionary path to i3
- All current deployments follow existing standards

## Standards

- SMS - all of the wireless standards to support SMS to 9-1-1 currently exist
  - CDMA (deployed and tested)
  - GSM (deployed and tested)
  - LTE
- Location - Standards currently exist to provide idle mobile location
  - CDMA Cell Location (deployed and tested)
  - CDMA GPS X/Y Location (tested)
  - GSM Cell Location (deployed and tested)
- Direct Delivery - NENA i3 defines direct text delivery to PSAP
- Real Time Text - 3GPP developing standards

# Possible Options for Nationwide Delivery of Text to Legacy PSAPs



## Possible Options for Nationwide Delivery of Text to Legacy PSAPs

- Relay Center
  - No new operational procedures at PSAP
  - Relay agent can ask caller for location
  - Added cost of Relay Agent and Native 9-1-1 voice network
- Text to TTY Gateway
  - Requires Cell location to route call
  - New operational procedures at PSAP
  - Requires New hardware (TTY Gateway)
  - No means of error correction between PSAP and caller
  - Added cost of native 9-1-1 voice network for TTY
- Text to Voice and Voice to Text Gateway
  - Requires Cell location to route call
  - New operational procedures at PSAP
  - Requires expensive voice processing HW/SW such as Nuance
  - Voice to text engines not perfect. Problems with accents, dialects, etc
  - Errors could cause confusion at PSAP and caller
  - Added cost of Native 9-1-1 voice network

- Direct SMS-to-911
  - Wireless Carrier Functional Elements
    - IMLC Functionality
    - 9-1-1 Message Center
    - Text Positioning Center
  - Cost: 20M
    - 24.5% Investment
    - 35% Network Expenses
    - 40.5% Non-network Expense
- SMS Relay Center
  - Costs in addition to Direct SMS-to-911
  - Functional Elements
    - Relay Center Overhead
    - Native Routing Costs

- ESI-net-Emergency Services IP Network
- ESRP-Emergency Services Routing Proxy
- HLR-Home Location Register
- IMLC-Idle Mode Location Center
- MO-Mobile Originating
- MT-Mobile Terminating
- MSC-Mobile Switching Center
- OTT-Over the Top
- RTT-Real Time Text
- SMPP-Short Message Peer to Peer Protocol
- STP-Signaling Transfer Point
- TPC-Text Positioning Center
- TSR-Text Selective Router