Dwight D. Eisenhower State Office Building
700 S.W. Harrison Street
Topeka, KS 66603-3745

Kansas Department of Transportation
Bureau of Maintenance

Phone: 785-296-3576
Fax: 785-296-6944
kdot#publicinfo@ks.gov
http://www.ksdot.org

Julie L. Lorenz, Secretary
Jaci Vogel, P.E., Chief

Laura Kelly, Governor

KANSAS HIGHWAY PATROL

State of Kansas
KSICS Usage – System Guidance
(Kansas State Interoperability Communication System)

December 2021

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Signature Page

Approved by:

Name/Title/Agency	Date
Name/Title/Agency	Date
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Record of Changes

Change No.	Date	Description	Signature
001	December 2021	Document created	

This Standard Operating Procedure (SOP) is subject to information updates and changes. The use of this Record of Change helps manage SOP modifications throughout the life of this document. All attempts have been made to ensure the accuracy of the information within this SOP.

Executive Summary

The Kansas State Interoperable Communication System (KSICS) consists of 800 MHz tower sites owned by the Kansas Department of Transportation (KDOT) and many different local agencies throughout the state. The statewide wide-area trunked P25 type II compliant radio system, in combination with the option to lease 800 MHz radios, provided users who desire to operate in this environment greater communications flexibility and interoperability. In addition to the 800 MHz enhancement, KDOT installed, at each of its 76 tower sites, a method for other non-800 MHz public safety and local governmental users to communicate. The method chosen for non-800 MHz users to achieve interoperable communications included the installation of the Motorola MOTOBRIDGE audio gateway connected to low VHF radios, high VHF radios, UHF radios, and 800 MHz Mutual Aid radios. The frequencies selected for use in these frequency bands include either the national interoperability channels or designated public safety channels.

Overview

The enhanced 800 MHz communication system allowed first responders, the Kansas Highway Patrol (KHP) and other emergency response agencies to communicate with each other effectively and seamlessly across the state. This statewide capability helps reduce response time and improve coordination during large area emergencies which frequently occur during severe weather and natural disasters such as tornadoes and floods, multi-agency responses to fires and hazmat releases, and the pursuit of criminal suspects across local jurisdictional boundaries, all of which will promote public safety. The State of Kansas, in conjunction with the Cybersecurity and Infrastructure Security Agency (CISA) Interoperable Communication Technical Assistance Program (ICTAP), created this guidance to provide KSICS users with a unified document.

Conclusion

This document lays out the framework for system best practices, rules and general guidance on KSICS system usage. The CISA Encryption best practices along with the KSICS user agreements are included in this document. A variety of documents were utilized to frame up this guidance along with an active workgroup across numerous disciplines.

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1. Introduction

Public safety agencies within the State of Kansas recognize the need for interagency communication, interoperability, and cooperation. Kansas police, fire response, and Emergency Medical Services (EMS) have well-established day-to-day capabilities and mutual aid agreements in place. Today's public safety realities highlight the need for agencies to work together to establish communications interoperability and mutual aid plans not only across traditional jurisdictional boundaries but across disciplines as well.

To remedy the lack of interoperable communications among disciplines and agencies, public safety agencies lean heavily on the use of the Kansas State Interoperable Communication System (KSICS) which includes its MOTOBRIDGE feature. The State of Kansas worked cooperatively with public safety agencies across the state to develop this Standard Operating Procedure (SOP).

2. Scope

The scope of this SOP is to delineate the authority, roles, and procedures for incident/event public safety personnel to coordinate the use of the KSICS as a means to achieve interoperable communications across agencies in Kansas.

3. Document Terminology

The terms "shall", "must" and "required" are used throughout this document to indicate required parameters and to differentiate from those parameters that are recommendations. Recommendations are identified by the words "should", "desirable", or "preferably".

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4. KSICS Usage

The State of Kansas has adopted the National Incident Management System (NIMS) as the framework for management of all emergency incidents within the state. Establishing standardized operating guidelines, procedures, and protocols for utilization of interoperability resources is directly aligned with objectives and initiatives contained in the National Emergency Communications Plan (NECP) as well as the Communications and Information Management Component of NIMS. NIMS elements addressed by or embedded in this SOP document include:

- Training and exercises.
- Usage of common terminology and nomenclature.
- Provides a mechanism for establishing a common operating picture.
- Common technology platform for interoperability.
- Offers potential solution for Strategic, Tactical, and Support communications.
- Communication of incident information.
- Establishes radio usage procedures.

Authorized signature(s) below confirm that this SOP document has been reviewed and approved by the Statewide Interoperability Advisory Committee (SIAC) for compliance with the National Incident Management System and certified by the SIAC Chairperson.

(SIAC Chair) Signature	Title/Agency	Date
(KSICS Administrator) Signature	Title/Agency	Date
(Vice Chair) Signature	Title/Agency	Date

5. Migration to KSICS, Templates and Programming

Step 1: Validate that the county/agency has a signed shared user agreement with Kansas Department of Transportation (KDOT).

Step 2: Purchase authorized equipment based on the attached radio requirements guidance. The following features are required (to be capable of being added):

- Approved by P25 Compliance Assessment Program (CAP)
- P25 Phase 2
- 700/800 MHz
- Multi-key
- AES 256 Encryption
- Over the Air Rekeying (OTAR)

Step 3: Request ID for the radios that will need access to KSICS.

Step 4: Contact your vendor for programming of the radio.

Note: If you are using Encryption, you must utilize the state encryption template.

The following regional and statewide talkgroups are required in ALL KSICS radios to ensure interoperability. These talkgroups shall be considered the base load for radio equipment while additional local channels can be added.

5.1. Regional Talkgroup Information

- Although regional talkgroups are organized by zone, they are available for use statewide.
- Each zone's talkgroups are set up identically to correspond with the position of the channel selector on the radio (the first 8 channels are the same in all zones).
- There are 16 positions on the radio's channel selector knob. (Note: That is not the case with all equipment, especially mobile units).
- The channel is named with the region and zone indicator and then the discipline. Example: SE1-PSAP is the Southeast Region, Zone 1, PSAP talkgroup.
- The Kansas Highway Patrol (KHP) Event channels in each zone are specific to certain towers.
- Use the County listing to find which zone you need to be in to communicate within the appropriate talkgroup, then set your radio to that zone and turn the selector knob to get to the correct channel.
- Listing of the channels in each zone:

Table 1: Regional Talkgroup Layout (Channel Type)

PSAP
MED (Hospitals/Medical)
TAC 1 (Tactical)
TAC 2 (Tactical)
AES (Encrypted)
KDEM CALL (Kansas Division of Emergency Management Calling)
NWS (National Weather Service for the region specified)
Channel 8 and on are KHP event channels specific to that zone

Table 2: Regional Talkgroup Layout SE1 – NC8

Ch	SE1	SE2	KC3	NE4	NE5	NE6	NC7	NC8
1	SE1-PSAP	SE2-PSAP	KC3-PSAP	NE4-PSAP	NE5-PSAP	NE6-PSAP	NC7-PSAP	NC8-PSAP
2	SE1-MED	SE2-MED	KC3-MED	NE4-MED	NE5-MED	NE6-MED	NC7-MED	NC8-MED
3	SE1-TAC 1	SE2-TAC 1	KC3-TAC 1	NE4-TAC 1	NE5-TAC 1	NE6-TAC 1	NC7-TAC 1	NC8-TAC 1
4	SE1-TAC 2	SE2-TAC 2	KC3-TAC 2	NE4-TAC 2	NE5-TAC 2	NE6-TAC 2	NC7-TAC 2	NC8-TAC 2
5	SE1-AES	SE2-AES	KC3-AES	NE4-AES	NE5-AES	NE6-AES	NC7-AES	NC8-AES
6	KDEM-CALL	KDEM-CALL	KDEM-CALL	KDEM-CALL	KDEM-CALL	KDEM-CALL	KDEM-CALL	KDEM-CALL
7	NWS WICH	NWS WICH	NWS TOP	NWS TOP	NWS TOP	NWS TOP	NWS GOOD	NWS GOOD
8	H-EVNT-1	H-EVNT-1	A-EVNT-1	A-EVNT-1	B-EVNT-1	B-EVNT-1	C-EVNT-1	C-EVNT-1
9	H-EVNT-2	H-EVNT-2	A-EVNT-2	B-EVNT-1	B-EVNT-2	B-EVNT-2	C-EVNT-2	C-EVNT-2
10	H-EVNT-3	H-EVNT-3	A-EVNT-3	B-EVNT-2	B-EVNT-3	B-EVNT-3	C-EVNT-3	C-EVNT-3
11				B-EVNT-3	C-EVNT-1	C-EVNT-1	D-EVNT-1	
12				C-EVNT-1	C-EVNT-2	C-EVNT-2	D-EVNT-2	
13				C-EVNT-2	C-EVNT-3	C-EVNT-3	D-EVNT-3	
14				H-EVNT-1				
15				H-EVNT-2				
16				H-EVNT-3				

Table 3: Regional Talkgroup Layout SC9-NW14

Ch	SC9	SC10	SW11	SW12	NW13	NW14
1	SC9-PSAP	SC10-PSAP	SW11-PSAP	SW12-PSAP	NW13-PSAP	NW14-PSAP
2	SC9-MED	SC10-MED	SW11-MED	SW12-MED	NW13-MED	NW14-MED
3	SC9-TAC 1	SC10-TAC 1	SW11-TAC 1	SW12-TAC 1	NW13-TAC 1	NW14-TAC 1
4	SC9-TAC 2	SC10-TAC 2	SW11-TAC 2	SW12-TAC 2	NW13-TAC 2	NW14-TAC 2
5	SC9-AES	SC10-AES	SW11-AES	SW12-AES	NW13-AES	NW14-AES
6	KDEM-CALL	KDEM-CALL	KDEM-CALL	KDEM-CALL	KDEM-CALL	KDEM-CALL
7	NWS WICH	NWS WICH	NWS DODG	NWS DODG	NWS GOOD	NWS GOOD
8	C-EVNT-1	E-EVNT-1	E-EVNT-1	E-EVNT-1	D-EVNT-1	D-EVNT-1
9	C-EVNT-2	E-EVNT-2	E-EVNT-2	E-EVNT-2	D-EVNT-2	D-EVNT-2
10	E-EVNT-1	E-EVNT-3	E-EVNT-3	E-EVNT-3	D-EVNT-3	D-EVNT-3
11	E-EVNT-2	F-EVNT-1			E-EVNT-1	
12	E-EVNT-3	F-EVNT-2			E-EVNT-2	
13	F-EVNT-1	F-EVNT-3			E-EVNT-3	
14	F-EVNT-2	YODER				
15	F-EVNT-3					
16	YODER					

5.2. Statewide Talkgroups Information

Use of the statewide talkgroups listed in the table below must be requested through the Statewide Interoperability Coordinator (SWIC) / Emergency Communication Section.

Statewide ICS talkgroups -- may be used for multiagency events if expands beyond a sub-region (e.g., Wildland Fire).

Mutual Aid (M/A) 800 and 700 MHz – Using the national interoperability channels listed in the table below, MOTOBRIDGE can connect or "patch" these channels between disparate radio systems.

State – State agency owned talkgroups that can be used for a major event.

- Kansas Turnpike Authority (KTA)
- State Fire Marshal (SFM)
- Wildlife & Parks (W&P)

Table 4: Statewide Talkgroup and Mutual Aid Layout

Ch	Zone 1-ICS	Zone 2-ICS	South ERT-ICS	North ERT-ICS	M/A 800	M/A 700 *	M/A 700 **	STATE
1	KDEM CALL	KDEM CALL	ICS-1	ICS-11	8CALL90	7CALL50	7CALL70	KTA South
2	ICS-1	ICS-11	ICS-2	ICS-12	8CALL90D	7CALL50D	7CALL70D	KTA North
3	ICS-2	ICS-12	ICS-3	ICS-13	8TAC91	7TAC51	7TAC71	KTA Event-1
4	ICS-3	ICS-13	ICS-4	ICS-14	8TAC91D	7TAC51D	7TAC71D	KTA Event-2
5	ICS-4	ICS-14	ICS-5	ICS-15	8TAC92	7TAC52	7TAC72	KTA Event-3
6	ICS-5	ICS-15	ICS-6	ICS-16	8TAC92D	7TAC52D	7TAC72D	SFM INV-1
7	ICS-6	ICS-16	ICS-7	ICS-17	8TAC93	7TAC53	7TAC73	SFM HZM-1
8	ICS-7	ICS-17	ICS-8	ICS-18	8TAC93D	7TAC53D	7TAC73D	SFM SAR-1
9	ICS-8	ICS-18	ICS-9	ICS-19	8TAC94	7TAC54	7TAC74	SFM CMD-1
10	ICS-9	ICS-19	ICS-10	ICS-20	8TAC94D	7TAC54D	7TAC74D	SFM TAC-1
11	ICS-10	ICS-20	COMMON-1	COMMON-5		7TAC55	7TAC75	W&P EVT 1
12	COMMON-1	COMMON-5	COMMON-2	COMMON-6		7TAC55D	7TAC75D	W&P EVT 2
13	COMMON-2	COMMON-6	COMMON-3	COMMON-7		7TAC56	7TAC76	W&P EVT 3
14	COMMON-3	COMMON-7	COMMON-4	COMMON-8		7TAC56D	7TAC76D	W&P EVT 4
15	COMMON-4	COMMON-8	COMU	COMU				W&P EVT 5
16	COMU	COMU						MERG-4
						* Denotes Primary Calling Channel		
						** Denotes Secondary Calling Channel		

5.3. Programming Procedures for KSICS Equipment

An Advanced System Key (ASK) is a specialized hardware device used in programming subscriber equipment (radios.) The ASK has predefined security and permissions to prevent unauthorized use of software, programming information, and radio types that access KSICS. Programming capability is only authorized by KDOT to authorized radio shops and infrastructure owners. Key holders are required to complete a programming training delivered by their specific radio manufacturer and may be required by KDOT to show proof of certification or course completion prior to issuance of the ASK. Computers used for KSICS system level programming are not allowed to connect to the open internet. Software system keys are not permitted across the KSICS system. ASK holders are held to the highest standards in order to ensure the integrity of the system, the radio equipment, and the first responders that rely on a radio in performance of their duty.

6. Baseline System Usage Guidance – Best Practices

Each radio in a shared system, such as the Kansas 800 MHz P25 system, affiliates with one tower site, one Zone Controller, and one talkgroup at a time. Sites are linked by fiber/T-1 lines, phone lines or microwave, which creates a network of repeated connectivity. Under normal circumstances, the system operates as a Wide Area network, which allows users to communicate not only with others affiliated with the same site, but also with those affiliated with other sites across the network. Users can communicate across cities, counties and even across the state.

The KSICS and the statewide interoperable template give communications capabilities to command and operational personnel responsible for responding to a regional incident requiring multiple jurisdictions and disciplines. It is intended to support multi-agency, multi-jurisdictional communication capabilities when other means of communication are not adequate. KSICS serves as a communication system available to public safety users, state agencies and local agencies who have elected to migrate to it.

1) The following protocols will be utilized when KSICS is activated for interoperability purposes:
   a) NIMS compliant ICS structure will be utilized on the response.
   b) Plain language will be utilized for radio communications in accordance with NIMS standards.
   c) Unit identification will consist of home city or county and agency, to avoid any confusion of units that might share the same identifier.
   d) All radios will operate in a “clear” mode, if encryption capable, unless otherwise directed.
   e) The Incident Commander, or Communications Unit Leader (COML) if assigned, will ensure that utilized talkgroups are monitored while in use.
2) The following list is a hierarchy of projected operational needs based on priority, with the first operation holding the highest priority. The list is provided for operational context for use of the KSICS system for interoperability.
   a) A large-scale emergency incident requiring multi-agency, multi-jurisdictional response.

b) Everyday response-level communications to emergency or urgent incidents that require mutual aid response from multiple agencies, when other common means of communication are not available.

c) Special event control activities, generally of a pre-planned nature, involving joint participation of two or more agencies.

d) Drill, maintenance, and test exercises.

During operations:

- Notify responding units of the appropriate talkgroups and have the units switch to the designated interoperability resource. Confirm that responding units are operating on the appropriate talkgroup.
- Monitor the talkgroups to address requests as required.
- Monitor the talkgroups for problems that may arise that may require technician intervention, or for system problems.
- When the interoperability resources of KSICS are no longer required, the following deactivation procedures should be followed: An announcement that the KSICS interoperability resources are being operationally deactivated will be made over the talkgroup(s) being utilized. Prior to deactivation of the talkgroups, agencies should ensure that all personnel have returned to their appropriate home systems. After deactivation of the interoperability resources, normal operations may be resumed.

6.1. Talkgroup Procedures

- Local incidents should utilize regional, interoperability talkgroups (i.e., PSAP, MED, TAC 1, TAC 2, AES, etc.) for small scale events. Regional talkgroups are listed in Section 5, Tables 1-3.
- Large multi-agency incidents or training should utilize ICS talkgroups (i.e., Zone 1 (ICS-1 through ICS-10, COMMON-1 through COMMON-4, and COMU) and Zone 2 (ICS-11 through ICS-20, COMMON-5 through COMMON-8, and COMU) for larger scale events of longer duration (i.e., more than one day.) ICS talkgroups are listed in Section 5, Table 4.
- Users accessing Kansas Highway Patrol (EVNT) talkgroups should refer to their Shared-Use Agreement signed with the Kansas Department of Transportation.

ICS Talkgroups are Utilized for Emergency Training/Events

1. KDEM – Call (KDEM staff duty officer monitored 24/7)
2. KDEM – 1 (Internal KDEM talkgroup only)
3. KDEM – 2 (Internal KDEM talkgroup only)
4. ICS 1 – ICS 20 (Talkgroups available on-scene incident communications as per direction of Incident Commander)
5. Common 1 – Common 8 (Talkgroups available for Incident command staff only)

Assigning an ICS Operations Channel

Assignment of ICS operational channels are made through the Statewide Interoperability Coordinator (SWIC)/Kansas Division of Emergency Management Communication Leader. Users are to request channel access prior to utilization for training events.

Tracking information will be located on the WebEOC Communications calendar. Emergency Channel usage will be coordinated through the ESF-2 and assigned COML. Contact information listed below.

6.2. Patching

Patching can have a variety of terms that mean the same thing: (Patching, Bridging, etc.). KSICS is utilized for interoperability with users on the statewide 800 MHz P25 digital trunked radio system. KSICS is not intended to be made interoperable with local level radio systems through the use of mobile gateway or console patches. Patching of local channels to talkgroups on KSICS is prohibited. MOTOBRIDGE patching is acceptable and a full procedure is described in this document.

6.3. Paging

Paging is accomplished across Kansas in a variety of formats. Currently, a majority of agencies either page requests for services on low band or VHF. Paging has remained relatively unchanged over the last twenty years. As technology advances, new forms of alerting will be included in this guidance. Currently, paging operations are not authorized on KSICS. The National Weather Service (NWS) does utilize alerting talkgroups for the purpose of weather updating across Kansas.

6.4. Encryption

KSICS is built on the Project 25 (P25) standard; therefore, this policy recommends the use of P25 encryption, standards-based security solution using NIST FIPS 140-2/197 compliant Advanced Encryption Standard (AES) 256-bit to ensure the highest level of secure communication and interoperable communications. AES, Data Encryption Standard (DES) and Motorola Advanced Digital Privacy (ADP) are the most common algorithms used today. Agencies are encouraged to load their local encryption requirements and any interoperability keys available in the State of Kansas. Agencies that continue use of RC4/ADP, AES 128 or DES algorithms should consider a plan on transitioning to AES 256 in the future. National Interoperability keys continue to operate with both AES 256 and DES algorithms.

It is important to note that AES 256 is the only algorithm that is recognized by the Department of Homeland Security's P25 Compliance Assessment Program (P25 CAP), which sets the requirements for grant eligible equipment. This means that to be compliant with P25 CAP requirements, radios must:

1. Have no encryption; or
2. Have AES 256 (for U.S. agencies only); or
3. Have AES 256 along with any other non-standard encryption algorithms.

Additional information can be found at https://www.dhs.gov/science-and-technology/approved-grant-eligible-equipment

The following Common Key Reference (CKR) / Storage Location Number (SLN) tables for Kansas are designated for AES 256 algorithm. And must be followed.

Table 5: State of Kansas CKR/SLN Plan

STATE OF KANSAS ENCRYPTION SLN/CKR PLAN		
SE1		
COUNTY	CO #	SLN/CKR
Allen	1	1460-1469
Bourbon	6	1470-1479
Cherokee	11	1480-1489
Crawford	19	1490-1499
Labette	50	1500-1509
Neosho	67	1510-1519
Allen	1	1460-1469
Bourbon	6	1470-1479
SE2		
COUNTY	CO #	SLN/CKR
Allen	1	1460-1469
Bourbon	6	1470-1479
Cherokee	11	1480-1489
Crawford	19	1490-1499
Labette	50	1500-1509
Neosho	67	1510-1519
Allen	1	1460-1469
Bourbon	6	1470-1479
KC3		
Johnson	46	1580-1589
Leavenworth	52	1590-1599
Wyandotte	105	1600-1609
MARC (MARRS)		1420-1439
Johnson	46	1580-1589
NC7		
Cloud	15	1610-1619
Jewell	45	1620-1629
Michell	62	1630-1639
Osborne	71	1640-1649
Republic	79	1650-1659
Smith	92	1660-1669

STATE OF KANSAS ENCRYPTION SLN/CKR PLAN		
NC8		
COUNTY	CO #	SLN/CKR
Clay	14	1670-1679
Dickinson	21	1680-1689
Ellsworth	27	1690-1699
Lincoln	53	1700-1709
Ottawa	72	1710-1719
Saline	85	1720-1729
SC9		
Barton	5	1730-1739
Edwards	24	1740-1749
Harvey	40	1750-1759
Marion	57	1760-1769
McPherson	59	1770-1779
Pawnee	73	1780-1789
Reno	78	1790-1799
Rice	80	1800-1809
Stafford	93	1810-1819
NE4		
Anderson	2	1820-1829
Chase	9	1830-1839
Coffey	16	1840-1849
Franklin	30	1850-1859
Linn	54	1860-1869
Lyon	56	1870-1879
Miami	61	1880-1889
Morris	64	1890-1899
Osage	70	1900-1909
NE5		
Douglas	23	1910-1919
Geary	31	1920-1929
Shawnee	89	1930-1939
Wabaunsee	99	1940-1949

STATE OF KANSAS ENCRYPTION SLN/CKR PLAN		
NE6		
COUNTY	CO #	SLN/CKR
Atchison	3	1950-1959
Brown	7	1960-1969
Doniphan	22	1970-1979
Jackson	43	1980-1989
Jefferson	44	1990-1999
Marshall	58	2020-2029
Nemaha	66	2030-2039
Pottawatomie	75	2040-2049
Riley	81	2330-2339
Washington	101	2340-2349
SC10		
Barber	4	2050-2059
Butler	8	2060-2069
Comanche	17	2070-2079
Cowley	18	2080-2089
Harper	39	2090-2099
Kingman	48	2100-2109
Kiowa	49	2110-2119
Pratt	76	2120-2129
Sedgwick	87	2130-2139
Sumner	96	2140-2149
SW11		
Clark	13	2150-2159
Ford	29	2001-2010
Grant	34	2170-2179
Gray	35	2180-2189
Haskell	41	2190-2199
Hodgeman	42	2200-2209
Meade	60	2210-2219
Morton	65	2220-2229
Seward	88	2230-2239
Stanton	94	2240-2249
Stevens	95	2250-2259
Shawnee	89	1930-1939

STATE OF KANSAS ENCRYPTION SLN/CKR PLAN		
SW12		
COUNTY	CO #	SLN/CKR
Finney	28	2260-2269
Greeley	36	2270-2279
Hamilton	38	2280-2289
Kearny	47	2290-2299
Lane	51	2300-2309
Scott	86	2310-2319
Wichita	102	2320-2329
NW13		
Ellis	26	2330-2339
Graham	33	2340-2349
Ness	68	2350-2359
Norton	69	2360-2369
Phillips	74	2370-2379
Rooks	82	2380-2389
Rush	83	2390-2399
Russell	84	2400-2409
Trego	98	2410-2419
NW14		
Cheyenne	12	2420-2429
Decatur	20	2430-2439
Gove	32	2440-2449
Logan	55	2450-2459
Rawlins	77	2460-2469
Sheridan	90	2470-2479
Sherman	91	2480-2489
Thomas	97	2490-2499
Wallace	100	2500-2509
TRIBAL		
Sac and Fox		2510-2519
Iowa		2520-2529
Kickapoo		2530-2539
Potawatomi		2540-2549
STATE OF KANSAS		
State of Kansas	0	1440-1459

For further information on Encryption including KID assignments, please contact the Kansas SWIC:

Jason Bryant, Statewide Interoperability Coordinator, State of Kansas

785-452-0974 or email Jason.bryant@ks.gov

6.5. Dispatch Center Responsibility

Each PSAP across Kansas currently has a KSICS radio and should be monitoring for emergencies and monthly roll call checks.

6.6. Reduced System Performance with KSICS

In the event of communications failure, resulting in the inability to receive or transmit, the following procedure will be followed:

1. Users should contact their local radio department for assistance.
2. In the event of a KSICS system scheduled outage, notification should be made in advance to users affected.
3. In the event of a non-scheduled KSICS outage, users may experience conditions such as Out-of-Range, Site Trunking or Failsoft.

Non-Scheduled KSIC Outages:

Out-of-Range indication on the radio indicates the inability to access the communications towers. This condition can be a multitude of different causes:

- Power Outage
- Non-Line of Sight communications
- Incorrect talkgroup affiliation
- Subscriber unit failure
- Weather

Site Trunking

Site Trunking is probably the most misunderstood component of the statewide 800 MHz system and of any shared communication system. When the system goes into Site Trunking, many users think that the radio system is down. This is an inaccurate perception. When the radio system goes into Site Trunking, it is still working, but with reduced capabilities.

Even though the system is working as designed, a system in Site Trunking can frustrate users out in the field and in the dispatch center. A clear understanding of Site Trunking concepts and practices will alleviate some of that frustration and can help users recognize when their radio goes into that mode.

7. Requesting Resources

When requesting additional KSICS resources, it is important to identify the gap or current problem instead of specific resources needed. One example is a tower site on wheels. While a tower site on wheels is extremely useful for existing degraded or dark sites, it may not be the appropriate solution for every scenario.

Requests start at the Emergency Manager of the County and then progress to the State Emergency Operations Center (SEOC). At that point the request is routed to the SWIC / ESF2 lead for need determination.

8. Applicable Policies and Documents

8.1. Kansas Field Operations Guide

https://www.kansastag.gov/AdvHTML_Doc_Upload/KS-TICFOG%20ver%206.doc

8.2. KSICS End User Agreement *(Example)*

KANSAS DEPARTMENT OF TRANSPORTATION

COMMUNICATION SYSTEM INFRASTRUCTURE RADIO SHARED-USER FOR TALKGROUPS AGREEMENT

THE PARTIES to this Agreement are the Secretary of the Kansas Department of Transportation (Secretary) acting by and through the Kansas Department of Transportation (KDOT) and Thomas County, (Shared-User), collectively referred to as the Parties.

I. AUTHORITY FOR AGREEMENT

A The Secretary has authority to enter into agreements to effect the purposes of K.S.A. 2007 Supp. 75-5073 *et seq.*

B. The Secretary entered into a Memorandum of Understanding with the Kansas Highway Patrol (KHP) dated September 15, 2008 (MOU) which authorizes KDOT to enter into agreements with Public Safety Agencies as defined by K.S.A. 2007 Supp. 75-5073(e) to use KHP 800 MHz EVENT Talkgroups in accordance with this Agreement.

C. Shared-User is a public safety agency as defined by K.S.A. 2007 Supp. 75 5073(e)

II. PURPOSE OF AGREEMENT

The Secretary owns and maintains an 800 MHz P25 digital radio system (System) and is licensed by the Federal Communications Commission (FCC) to operate the System in Kansas. The Secretary allows certain users to share the System for public safety purposes.

III. DEFINITIONS

A. Talkgroup. A Talkgroup is an assigned radio channel that multiple users are given to conduct necessary communications.

IV. SECRETARY'S RESPONSIBILITIES:

The Secretary will:

A. Maintain a license pursuant to 47 C.F.R. §90.603(b) (2006).

B. Keep this Agreement as part of the Site's records until the Agreement is terminated for any reason by either the Secretary or the Shared-User.

C. Be responsible for the costs of maintaining and operating the System.

V. SHARED-USER'S RESPONSIBILITIES:

Shared-User shall:

A. Meet and maintain the requirements of eligibility for a license under 47 C.F.R. §90.603 and 47 CFR Subparts B or C (2006).

B. Be responsible for the cost of acquisition and maintenance of any additional radio equipment required to meet shared user's needs on the System.

C. Ensure any equipment provided pursuant to Paragraph V.B. complies with KDOT technical and performance standards that are intended to provide for reliable operation and prevent interference with the System by other users.

D. Report immediately to the Secretary or the Secretary's authorized representative any incident that causes loss of control of any radio communication equipment operating on any System Talkgroup.

E. Not cross-connect any KHP Talkgroup or other user Talkgroup without prior written consent from KDOT and KHP.

F. When using a KHP Talkgroup:

1. Limit transmissions on KHP Operational Talkgroups (Car to Station) to emergency transmissions only.
2. Limit transmission on KHP Event Talkgroups to emergency situations absolutely necessary for public safety related activities.
3. Limit transmission on KHP Direct Talkgroups (Car to Car) to those situations absolutely necessary for law enforcement related activities.
4. Not interfere with KHP Communication Center radio traffic.
5. Use plain language for all transmissions, emergencies or critical incidents.
6. Monitor its use of KHP Talkgroups and correct any inappropriateness.

VI. PARTIES MUTUALLY AGREE:

A. The Secretary makes no warranty and assumes no liability with respect to the programming of the Shared-User's radio equipment and the operational capability of the System.
B. To follow the operating requirements set forth in 47 C.F.R. § 90.403, and 47 C.F.R. Subpart N.

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8.3. State of Kansas MOTOBRIDGE Procedures

(Note: The complete MOTOBRIDGE Procedures may be found at https://www.kansastag.gov/AdvHTML_Doc_Upload/MOTOBRIDGE%20SOP%201-2012.pdf).

Introduction

For many years, Kansas emergency responders have identified the lack of readily available interoperable communications as a shortfall during a multi-disciplinary or multi-jurisdictional response. One step toward improvement of interoperable communications was the creation of a statewide fixed-site (stationary transmitters located on permanent tower sites) communications interoperability gateway that would be available upon demand, when needed, and as authorized. This system is known as MOTOBRIDGE.

These MOTOBRIDGE Standard Operating Procedures were developed to provide a description and common reference of operational protocols for the system. The contents were developed using multi-jurisdictional and multi-disciplinary input from emergency responders throughout Kansas.

Background

In May of 2008, a joint planning session including the Statewide Interoperability Executive Committee (SIEC) and the Communications Advisory Committee was held in Salina, Kansas to develop the Standard Operating Procedures for the MOTOBRIDGE System. 59 multi-jurisdictional and multi-disciplinary public servants attended the planning session. Core participation included representatives from the following disciplines:

- Law Enforcement (State and Local)
- Fire
- EMS
- Emergency Management (State and Local)
- Communications (State and Local)
- Transportation
- Medical
- Military

After reviewing the technical operation of the MOTOBRIDGE System, participants engaged in a question and answer process to determine the desired operational protocol. After the planning session, the SOPs were developed by the Kansas Office of Emergency Communications (KS-OEC) and approved by the SIEC.

System Overview

MOTOBRIDGE is a fixed-site interoperability gateway that is located on 76 tower sites owned by the Kansas Department of Transportation (KDOT). Like with any other radio system, actual coverage depends on issues such as terrain, frequency band, antenna height, weather, and functionality of the end- user radio equipment.

Using both national and state interoperability channels, MOTOBRIDGE can connect or “patch” pre-determined channels between disparate radio systems. This can be accomplished on a single site (Bourbon VHF patched to Bourbon UHF) or across multiple sites (Bourbon VHF patched to Sumner 800 MHz). The call-in, tactical, and

digital trunked channel names and frequencies used on the MOTOBRIDGE System include:

- VHF Low Band (State channels)
- VHF High Band (National Channels)
- UHF (National Channels)
- 800 MHz (National Channels)
- KHP Event Talkgroups (Kansas Statewide Interoperable Communications System (KSICS) users)

A channel patch is managed through an Operator at the Kansas Highway Patrol (KHP) Communications center by manipulating a software-based MOTOBRIDGE console.

One national or state call-in channel has been designated for each band of radio spectrum. The call-in channels are used to make requests for a MOTOBRIDGE patch and are monitored by KHP on each site at all times.

Like the call-in channels, a number of tactical channels have been established to promote shared-channel interoperability. These tactical channels are assigned in a checker-board fashion at all MOTOBRIDGE sites throughout the state. These tactical channels are patched through the MOTOBRIDGE System to provide cross-band and/or multi-site communications systems. Repeaters are utilized for tactical channels in the UHF and 800 MHz bands. Although the tactical channels are not continuously monitored by KHP Dispatch, following the general usage guidelines in Section 4, the tactical channels are available for use 24 hours a day, 7 days a week.

For users of KSICS, a KHP Event Talkgroup has been assigned to each site. These talkgroups can be used for both patch requests and tactical connections.

Usage

MOTOBRIDGE is intended for multi-disciplinary or multi- jurisdictional use when other common means of radio communications are not available. Generally, the system should be used by responders and critical facilities during activities that directly impact life safety and/or the preservation of property.

MOTOBRIDGE channels may be temporarily used by agencies that have unexpectedly lost local communications infrastructure due to external forces. If the system is being used for this purpose, KDOT and KHP should be notified in order to avoid disruptions (such as maintenance) of service.

Patch Request Procedure

A MOTOBRIDGE patch can be requested in a variety of ways including:

- Radio by using a call-in channel
- Telephone by calling KHP Dispatch at (785) 827-4437 or *47 from a cell phone
- Teletype to KHP from a PSAP

Some basic information is required in any situation when requesting a MOTOBRIDGE patch. The person asking for the patch, also known as a “requestor”, must identify themselves, provide their location, and provide the site(s) and radio bands to be patched. If a requestor does not know which site(s) will best suit their location, KHP Operators will evaluate the location and determine the site which provides the best coverage.

Use the following procedure to initiate a MOTOBRIDGE patch via radio:

- Contact “KHP Dispatch” on the designated call-in channel and identify by using home city/county + radio number (Logan County 601) or agency/facility name (Logan County Hospital). The requestor should also indicate their current location by county.
- Once KHP answers, request a MOTOBRIDGE patch then provide the bands and location(s) of the patch.
- Remain on the call-in channel. As a courtesy, KHP will notify the requestor that the patch is ready and the appropriate tactical channels to be used. Once complete, users will switch to the tactical channels to communicate.

An example:

> “Logan County 601 to KHP Dispatch from Wallace County” “KHP Dispatch.... go ahead”
>
> “Request MOTOBRIDGE patch” “Go ahead with request”
>
> “Patch Wallace UHF to Wallace VHF”
>
> “Wallace VTAC12 and Wallace UTAC42 are patched and ready”

The KHP Operator may request additional contact information from the requestor at the time of the patch request. This information may be necessary to check the status of the patch or to verify a request to discontinue the connection.

Patch Notification Procedure

In many cases, end users of a MOTOBRIDGE patch will be aware that the patch is being connected. This is accomplished by on-scene coordination through word of mouth or by other electronic means such as telephone or teletype. Every effort to coordinate a patch in the field should be taken.

In some cases, a patch may be requested without the targeted user’s knowledge. Generally, this applies when a requestor does not have the means to notify or coordinate with the target user. This is known as a “cold call”. In the event of a cold call, KHP Dispatch will make every effort to notify the target user. To do so, KHP Operators will need guidance from the requestor such as the agency, name or radio number of the target, and their agency contact information, if available. Unless notified of a cold call situation at the time of the request, KHP Dispatch will assume that the patch has already been coordinated in the field. It is the responsibility of the requestor to ask for a cold call notification.

Patch Discontinuation

A MOTOBRIDGE patch will remain active until a request is made to KHP Dispatch to discontinue. In situations where a patch would be considered short-term, typically measured in minutes or hours, KHP Operators will verify the continued need for the patch in four hour intervals from the time of the original request to ensure that a patch is still being utilized. During a large-scale incident or disaster, measured in days or weeks, regular verification will not be performed. A MOTOBRIDGE patch will not be discontinued unless positive verification is made from the requestor or their agency.

Generally, discontinuation of a patch should be handled by the person or agency who requested the original activation. Discontinuation of a patch via radio request

should be made on the call-in channel. Following the same procedure as patch activation, provide the location(s) and bands to be discontinued.

License Requirements

All fixed-site MOTOBRIDGE base-stations and repeaters located on the KDOT towers are owned by KDOT and licensed through the FCC. Any other base-station, control-station or repeater at the local level using the National or State Interoperability channels must be licensed by the FCC to the appropriate local government agency.

For mobile and portable use, the National Interoperability Channels are covered under a “blanket license”. If an agency is ELIGIBLE for a FCC part 90 radio license, the National Interoperability Channels may be programmed into equipment without having the channels individually licensed to the agency. **The state VHF Low-Band channels (39.58/39.70) used by MOTOBRIDGE require an FCC license through a local agency for fixed-site and mobile / portable use.**

Users of KSICS require no local licensing for the use of the system, assuming that the proper documentation has been filed with KDOT. Licenses for these channels are coordinated and held by KDOT on behalf of the local agency.

Signaling

For the purpose of this document, signaling is defined as any non- voice signal produced by radio equipment to identify, notify, or otherwise dispatch and coordinate responders. Examples of signaling include, but are not limited to:

- Paging
- DTMF
- Voice Encryption
- Push-to-Talk identification

MOTOBRIDGE uses nationally recognized interoperability channels designated for multi-jurisdictional and multi-disciplinary use. Currently there are no national signaling standards for these channels. The lack of standards could potentially lead to confusion and channel congestion. To avoid unnecessary confusion and to reduce channel congestion, signaling functions are not allowed on the MOTOBRIDGE system.

NIMS Compliance

Based on Presidential Directive (HSPD)-5, in 2005, Kansas Executive Order 05-03 established the National Incident Management System (NIMS) as the statewide standard for incident management. The current Kansas Emergency Response Plan was developed using NIMS principles, including the use of the Incident Command System (ICS), an integrated system of multi-agency coordination centers, and joint public information. Local emergency operations plans have been, or are currently being developed, from the same principles. The Kansas Response Plan (KRP) is developed and maintained by the Kansas Division of Emergency Management.

Plain Language

Over-the-air common terminology, otherwise known as plain- language, during an emergency or disaster is a requirement of the NIMS. Currently, the use of plain-language on local communications systems while conducting normal operations is

addressed by individual agency policy. A multi-agency response to an incident requires the use of plain-language for emergency operations.

MOTOBRIDGE is designed for multi-jurisdictional and multi- disciplinary use. To avoid confusion stemming from the use of non- standard codes, plain language should be used at all times while communicating on MOTOBRIDGE. The use of 10-codes and similar signaling codes should be avoided.

Incident Command System (ICS) Support

With the occurrence of a disaster or pre-planned event where the Incident Command System (ICS) may be implemented, MOTOBRIDGE can be used in support of the event. The Incident Commander or his/her designee within the ICS has authority to utilize MOTOBRIDGE as deemed necessary to coordinate and fulfill the communications needs of the appropriate responders.

Training and Exercise

As with any other tool used by emergency responders, communications equipment and systems such as MOTOBRIDGE should be regularly trained and exercised upon to promote familiarity and ease of use. As a general rule, agencies should train and exercise on communications equipment and protocol at least once annually. MOTOBRIDGE training could be as simple as a review of this document or subsequent training materials and a review of communications equipment to locate the channels used by the system.

A group exercise at a staff meeting or similar event should involve a patch request to KHP and a brief test of the patch on the tactical channels. Similar MOTOBRIDGE exercises are encouraged during other types of events such as a county or region-wide disaster exercise. To ensure the exercise will not interfere with more urgent emergency operations, as a courtesy, KHP Dispatch should be notified prior to the start of the exercise.

The Kansas Office of Emergency Communications (KS-OEC) provides instructor driven MOTOBRIDGE and KSICS training. This training may be requested through the KS-OEC. See https://www.kansastag.gov/OEC.asp?PageID=568.

System Administration and Trouble Reporting

The Kansas MOTOBRIDGE System is maintained by the Kansas Department of Transportation (KDOT). Questions concerning the administration and maintenance of the MOTOBRIDGE system should be directed to the KDOT system administrator via telephone at (785) 296-5948.

The Kansas Department of Transportation strives to provide the best quality communications systems. In order to do so, KDOT communications personnel need to know of any troubles or malfunctions of the MOTOBRIDGE system as soon as possible. System trouble reports should be directed to the KDOT Communications Section at (785) 296-3661. This is a recorded line after hours and on weekends. This is the same policy used for tower site notifications from the general public. In an emergency, after hours and weekend trouble reports should be directed to the KHP Central Dispatch Center via telephone or teletype. End user equipment (mobile, portable, base/control station) functionality and maintenance is the responsibility of the agency or department which owns the equipment.

The Kansas Highway Patrol is responsible for operating the MOTOBRIDGE consoles through taking patch requests and making patch connections. Concerns about the

operations level of MOTOBRIDGE functionality can be directed to the KHP Central Dispatch Center supervisory staff.

Many local and regional response agencies have purchased mobile gateway devices that provide channel patch capabilities similar to MOTOBRIDGE. Many of these mobile devices also rely upon using the National Interoperability Channels. The combination of mobile and fixed-site communications gateway equipment using the same frequencies commonly raises a concern about interference between the two systems. KDOT Communications staff will work in conjunction with the mobile gateway user to determine the cause of potential interference between the mobile device and MOTOBRIDGE. If it is determined that interference exists between the two systems, KDOT and local staff will work together to decide the best course of action to resolve the issue.

Equipment Requirements Quick Reference

- To operate on the MOTOBRIDGE system, users must have the channels used by the system properly programmed into their radio equipment.
- With the exception of VHF Low-Band, conventional radio equipment must have the capability of narrowband (12.5 KHz) operation in order to properly program the channels.
- By order of the Kansas SIEC, all public safety mobile and portable radio equipment purchased under the Public Safety Interoperable Communications (PSIC) Grant, and FY 2008 and subsequent Homeland Security Grant Programs, must have sufficient channel capacity to allow programming of the National Interoperability Channels designated for the radio band(s) being purchased. The order also states that all such equipment acquired will have the National Interoperability Channels programmed according to the NPSTC / KS SIEC Channel Naming Plan.

9. Training/Exercise

It is recommended by the State of Kansas that all public safety agencies incorporate the use of the KSICS system in all trainings and exercises when appropriate and feasible.

10. Updates & Revisions

Responsibilities of the Statewide Interoperability Advisory Committee (SIAC)

The SIAC has the responsibility to ensure this SOP is reviewed annually at a minimum. Requests for modifications or additions to this document should be submitted to the SIAC Point of Contact (POC) for distribution. Updates to this document can be recommended by any of the participating agencies.

The SIAC and its sub-committees will:

- Establish recommended training requirements in support of the SOP.
- Ensure that the SOP is maintained and updated at regular intervals, or as critical updated information is identified.
- Disseminate updated plans to all participating agencies.

- Promote interoperable communications capabilities through trained communications personnel.
- Promote regular interoperable equipment/solutions testing, assist agencies with test evaluations, and dissemination of the results.
- Re-evaluate regional requirements as technology evolves and circumstances dictate.
- Review communications related SOPs created by the included agencies, to preclude conflicts or non-compliance with current standards or initiatives.
- Governance structure will be established to ensure that legal, operational, technical, training, and funding issues are addressed.

SIAC POC:

Name:	Jason E. Bryant
Title:	SWIC/SIAC Chair
Address:	3617 S. Seneca, Wichita, KS 67217
Office Phone:	
Cell Phone:	785-452-0974
24/7 Phone:	
E-Mail:	Jason.bryant@ks.gov

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Appendix A KSICS STATEWIDE TOWER MAP

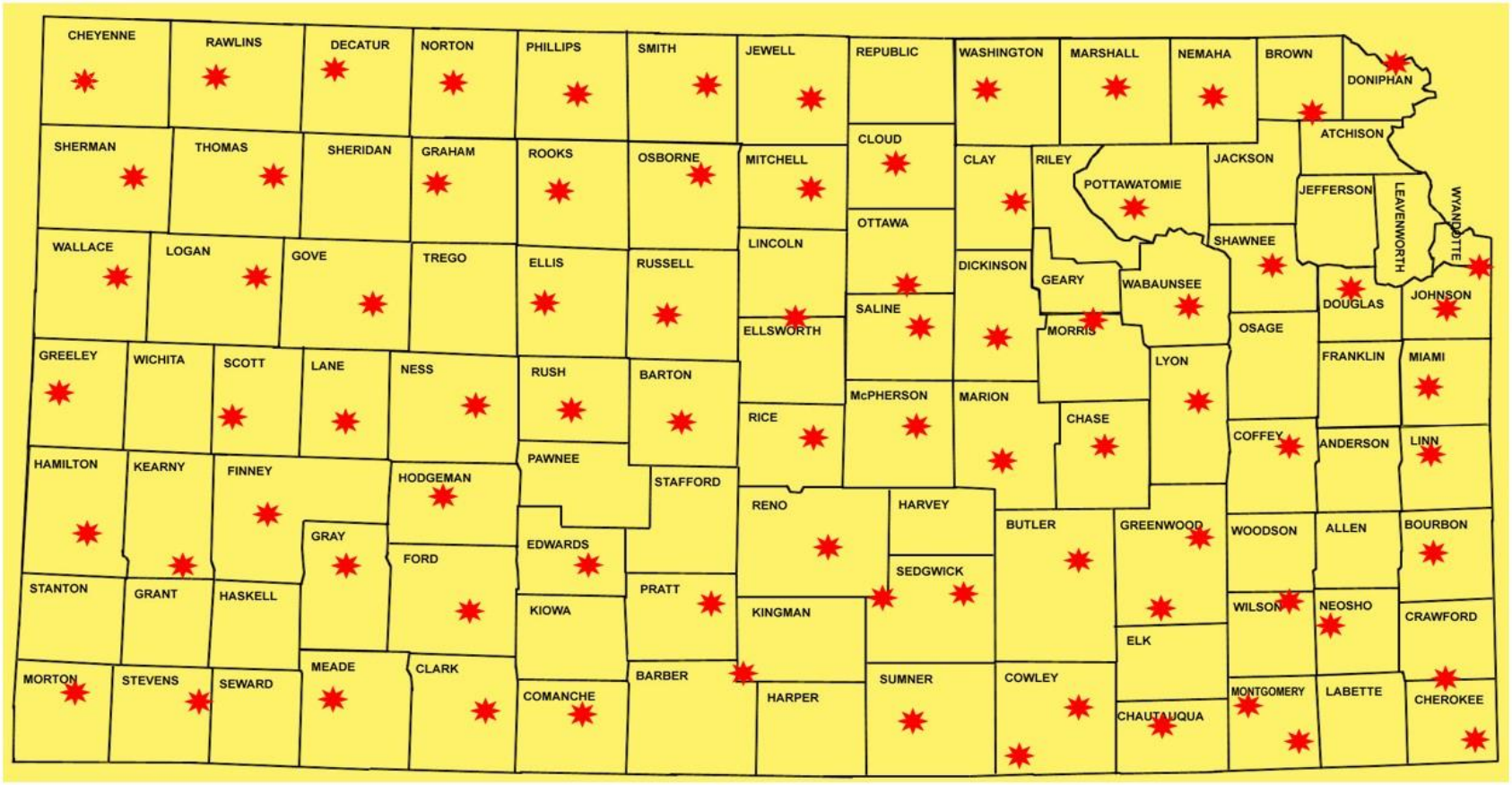

Figure A - 1: KSICS Tower Map

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Appendix B KSICS REGIONAL MOTOBRIDGE LAYOUT

This map or….

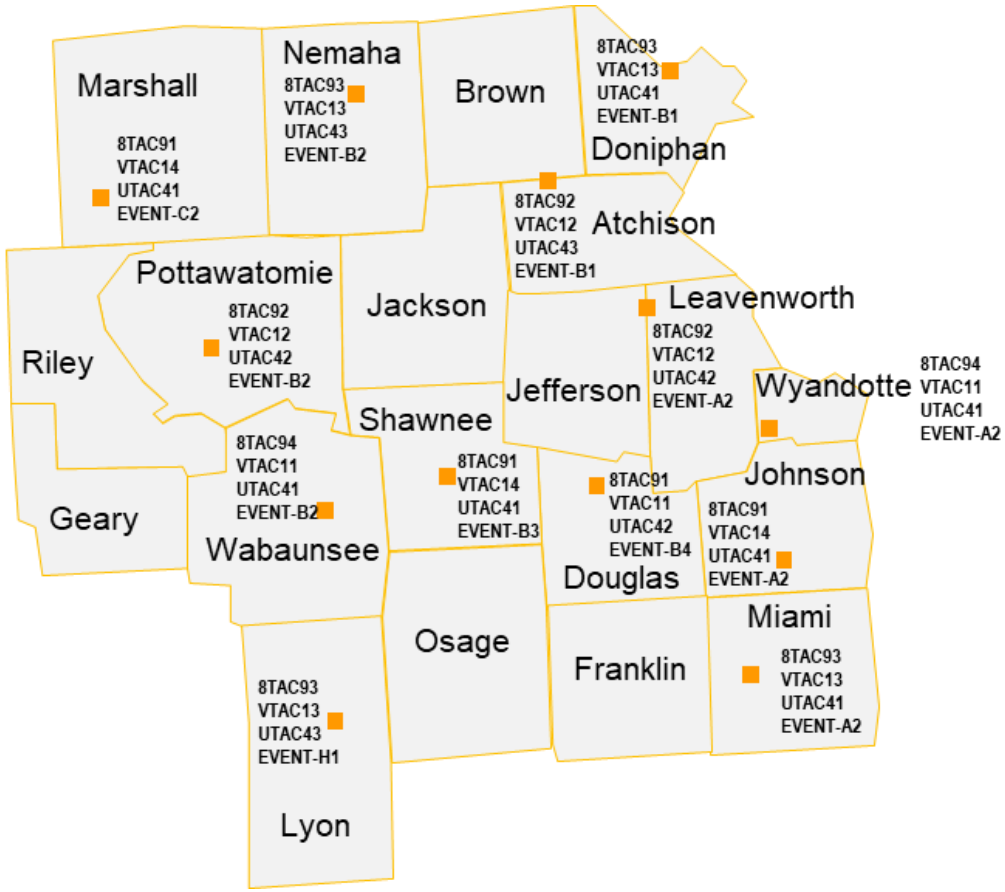

Figure B – 1: Northeast Kansas Mutual Aid Channels

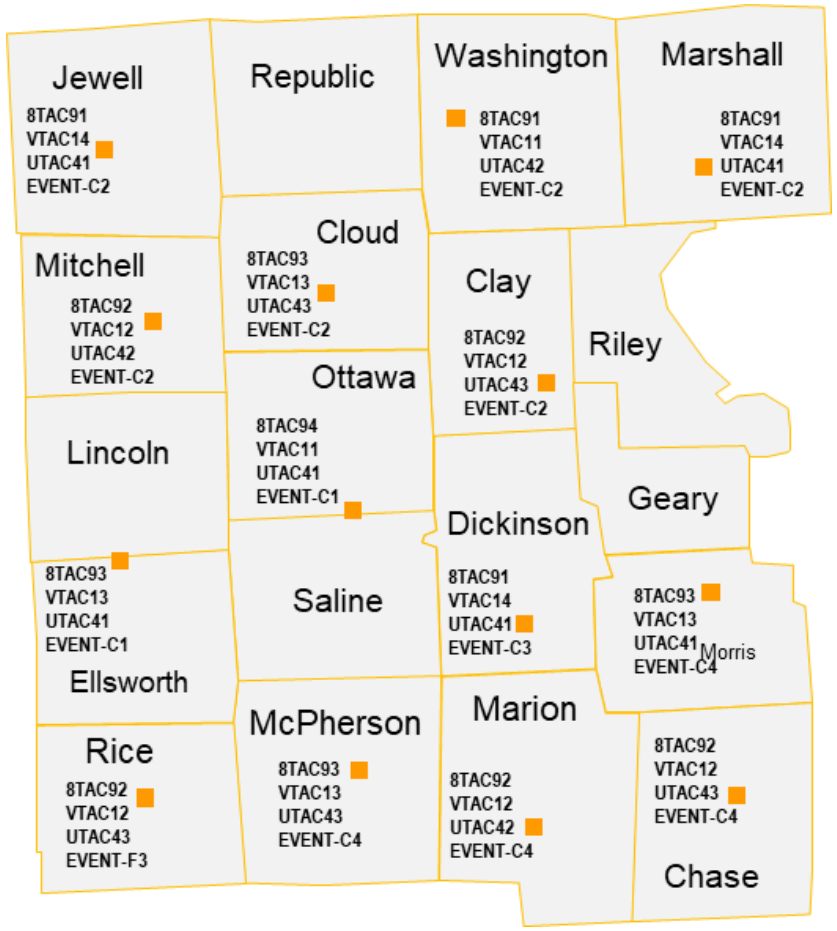

Figure B – 2: North Central Kansas Mutual Aid Channels

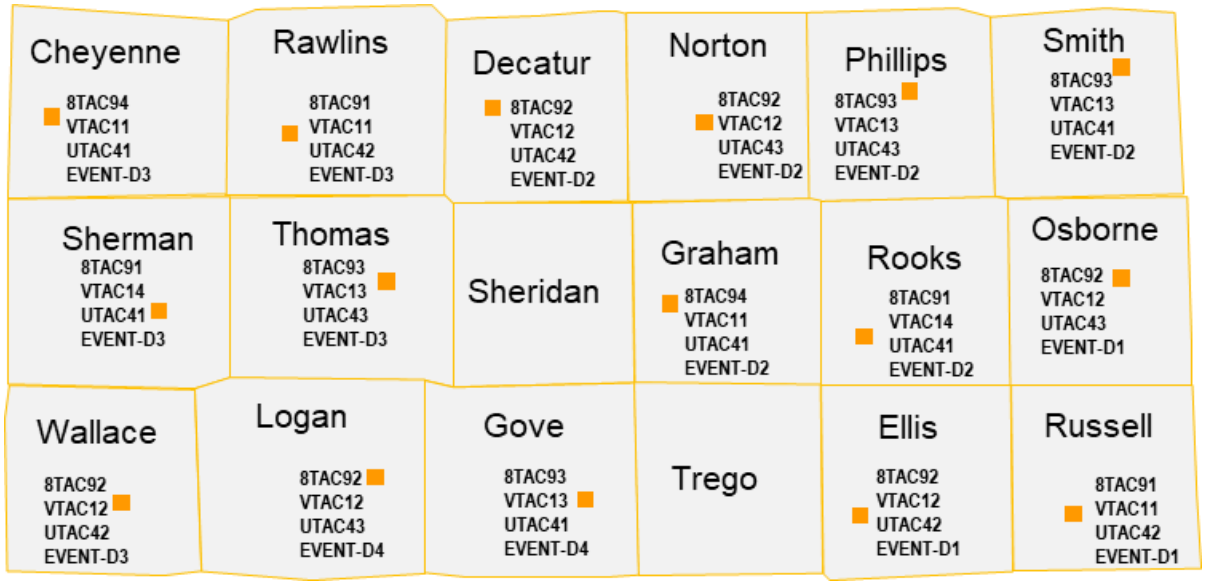

Figure B – 3: Northwest Kansas Mutual Aid Channels

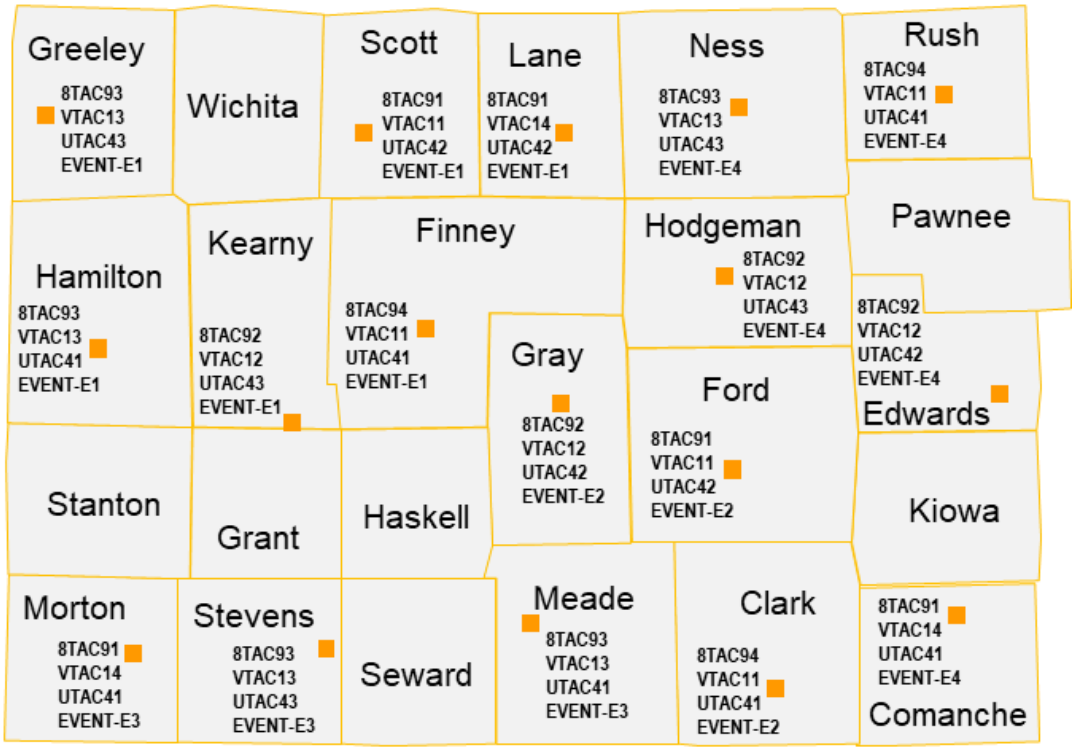

Figure B – 4: Southwest Kansas Mutual Aid Channels

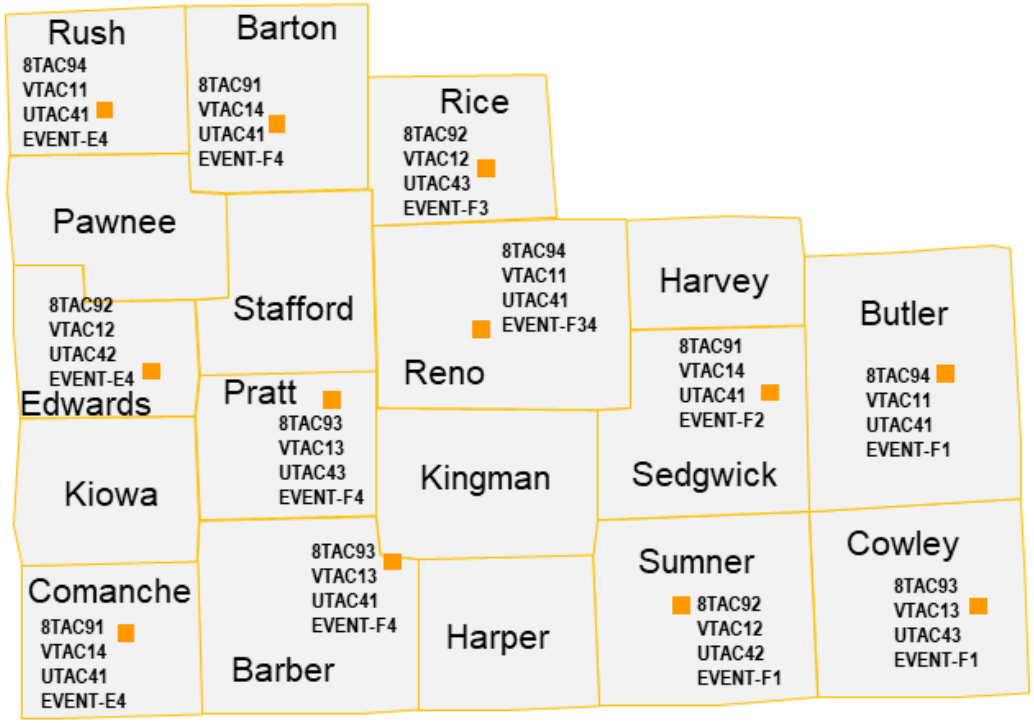

Figure B – 5: South Central Kansas Mutual Aid Channels

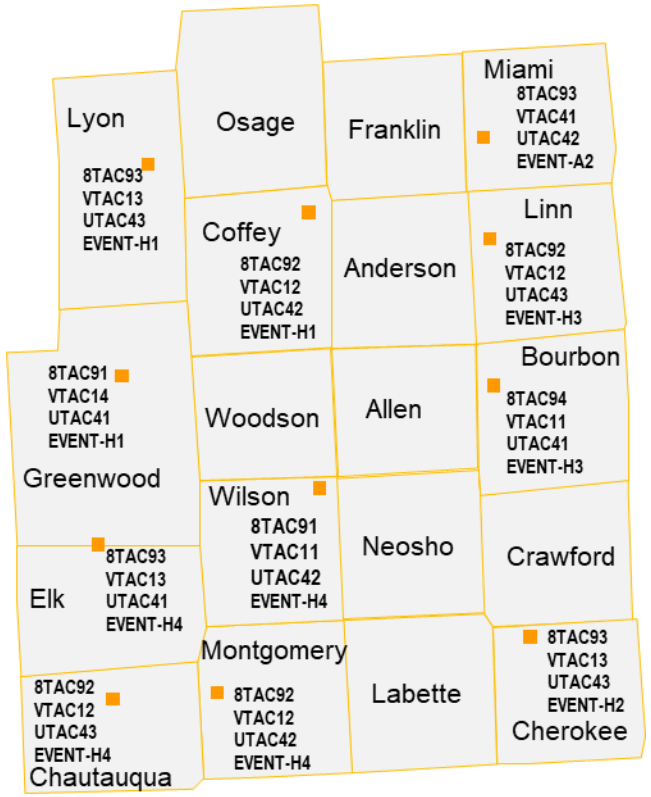

Figure B – 6: Southeast Kansas Mutual Aid Channels

Appendix C MOTOBRIDGE Layout

Table C - 1: MOTOBRIDGE Layout

LOW BAND FREQUENCIES (STATE FREQUENCIES)				
Channel Name	Mobile Rx.	Rx. P.L.	Mobile Tx.	Tx. P.L.
LCALLKS	39.5800	156.7	39.5800	156.7
LTACKS	39.7000	156.7	39.7000	156.7
VHF FREQUENCIES (NATIONAL FREQUENCIES)				
Channel Name	Mobile Rx.	Rx. P.L.	Mobile Tx.	Tx. P.L.
VCALL10	155.7525	156.7	155.7525	156.7
VTAC11	151.1375	156.7	151.1375	156.7
VTAC12	154.4525	156.7	154.4525	156.7
VTAC13	158.7375	156.7	158.7375	156.7
VTAC14	159.4725	156.7	159.4725	156.7
UHF FREQUENCIES (NATIONAL FREQUENCIES)				
Channel Name	Mobile Rx.	Rx. P.L.	Mobile Tx.	Tx. P.L.
UCALL40	453.2125	156.7	458.2125	156.7
UCALL40D	453.2125	156.7	453.2125	156.7
UTAC41	453.4625	156.7	458.4625	156.7
UTAC41D	453.4625	156.7	453.4625	156.7
UTAC42	453.7125	156.7	458.7125	156.7
UTAC42D	453.7125	156.7	453.7125	156.7
UTAC43	453.8625	156.7	458.8625	156.7
UTAC43D	453.8625	156.7	453.8625	156.7
800 MHZ FREQUENCIES (NATIONAL FREQUENCIES)				
Channel Name	Mobile Rx.	Rx. P.L.	Mobile Tx.	Tx. P.L.
8CALL90	851.0125	156.7	806.0125	156.7
8CALL90D	851.0125	156.7	851.0125	156.7
8TAC91	851.5125	156.7	806.5125	156.7
8TAC91D	851.5125	156.7	851.5125	156.7
8TAC92	852.0125	156.7	807.0125	156.7
8TAC92D	852.0125	156.7	852.0125	156.7
8TAC93	852.5125	156.7	807.5125	156.7
8TAC93D	852.5125	156.7	852.5125	156.7
8TAC94	853.0125	156.7	808.0125	156.7
8TAC94D	853.0125	156.7	853.0125	156.7

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Appendix D Glossary

Item/Acronym	Definition
ADP	Advanced Digital Privacy
AES	Advanced Encryption Standard
ASK	Advanced System Key
CAP	Compliance Assessment Program
CISA	Cybersecurity and Infrastructure Security Agency
CKR	Common Key Reference
COML	Communications Unit Leader
COMU	Communications Unit
DES	Data Encryption Standard
EMS	Emergency Medical Services
FCC	Federal Communication Commission
IC	Incident Command
ICS	Incident Command System
ICTAP	Interoperable Communications Technical Assistance Program
ID	Identification
KDEM	Kansas Division of Emergency Management
KDOT	Kansas Department of Transportation
KHP	Kansas Highway Patrol
KOEC	Kansas Office of Emergency Communications
KSICS	Kansas State Interoperable Communication System
KTA	Kansas Turnpike Authority
MHz	Abbreviation for megahertz. 5 MHz = 5,000,000 Hz or 5,000 kHz.
MOU	Memorandum of Understanding
NECP	National Emergency Communications Plan
NIMS	National Incident Management System
NPSTC	National Public Safety Telecommunications Council
NTIA	National Telecommunications and Information Administration
NWS	National Weather Service
OTAR	Over the Air Rekeying
P25	Project 25

Item/Acronym	Definition
POC	Point of Contact
PSAP	Public Safety Answering Point
SFM	State Fire Marshal
SIEC	Statewide Interoperability Executive Committee
SLN	Storage Location Number
SOP	Standard Operating Procedure
SWIC	Statewide Interoperability Coordinator
UHF	Ultra-High Frequency – Range of 300 to 3,000 MHz. For public safety LMR, usually refers to two bands. 380 to 460 MHz (low) and 460 to 512 MHz (high).
VHF	Very High Frequency – For public safety LMR, usually refers to VHF High Band with a range of 136 to 164 MHz. VHF Low Band has a frequency range below 100 MHz.
W&P	Wildlife & Parks