



Border Interoperability Demonstration Project

*Study on Rural and Urban Area Interoperability
Solutions along and across International Borders*

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Border Interoperability Demonstration Project

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1. Introduction

Interoperable communications is a fundamental challenge to all public safety agencies. Border communities face additional challenges due to technical, operational, and policy differences on both sides of the border. The 5,500 miles of U.S.–Canadian border and the nearly 2,000 miles of U.S.–Mexican border offer a diverse array of geographies, languages, and operating environments that pose unique challenges to the federal, state, local, and tribal responders operating in the regions. Furthermore, border community populations vary widely from sparsely populated rural areas and towns to more densely populated cities and metropolitan hubs. Population density impacts the types of interoperable solutions that will be most effective for a particular community.

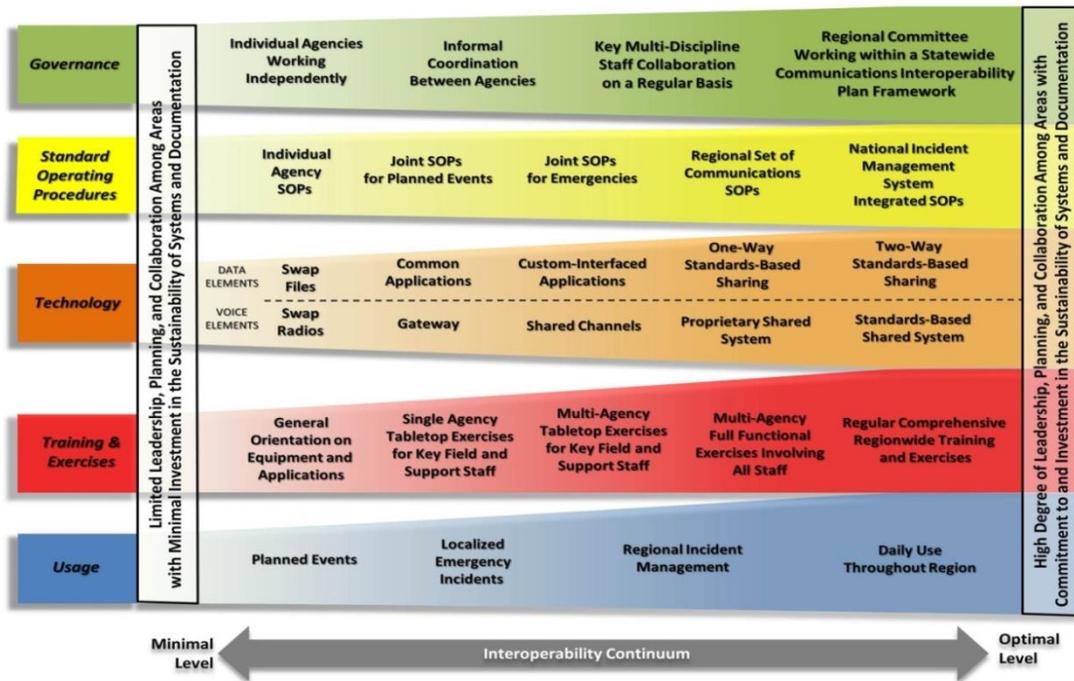
The Border Interoperability Demonstration Project (BIDP), a one-time grant administered by the Department of Homeland Security (DHS) Office of Emergency Communications (OEC), identified innovative solutions for improving interoperable communications along and across the border. One of BIDP’s project objectives specifically focused on border communities of varying population densities to ensure that selected recipients included both rural and urban areas. As a result, OEC awarded projects to communities that serve varying population densities (Figure 1). [Appendix A](#) includes additional information on BIDP.

Figure 1. Population Densities of BIDP Award Recipients

State	Lead Sub-Recipient	Population Density ¹			People per Square Mile	
		Metropolitan	Micropolitan	Rural	Minimum	Maximum
Arizona	City of Yuma	2	0	0	29	670
California	San Diego Fire-Rescue	1	0	0	670	670
Maine	County of Washington	0	0	5	11	26
Michigan	Wayne County	3	1	0	25	3357
Montana	Flathead County	0	2	9	1	15
Ohio	Lake County	2	0	0	998	1338
Texas	City of McAllen	2	0	0	363	370

The *BIDP Study on Rural and Urban Area Interoperability Solutions along and across International Borders* describes the challenges and interoperability solutions fielded by the BIDP award recipients, and contrasts findings specific to rural and/or urban areas. These findings may assist other border communities in evaluating potential solutions for their interoperability challenges, given specific population densities. In comparing rural and urban areas, this study examines similarities and differences using the Interoperability Continuum as a framework. Specifically, the study evaluates how BIDP projects supported selected border communities’ progression across the Interoperability Continuum’s five elements—governance, standard operating procedures, technology, training and exercises, and usage (Figure 2).¹

Figure 2. Interoperability Continuum



Developed with practitioner input by DHS’s SAFECOM program, the Interoperability Continuum is designed as a guide for agencies pursuing a new interoperability solution based on changing needs or additional resources. Agencies across the nation use the Interoperability Continuum to plan and track progress in strengthening interoperable communications. The Interoperability Continuum also supports national preparedness doctrine including the *National Incident Management System* (NIMS), the *National Response Framework* (NRF), and the *National Emergency Communications Plan* (NECP).² As such, BIDP recipients referenced the Interoperability Continuum when planning projects and outlined how their projects advanced the community along its five interdependent elements.

¹ For additional information on the Interoperability Continuum, see: <https://www.dhs.gov/safecom/resources-library>.

² For information on NIMS, see: <https://www.fema.gov/national-incident-management-system>; the NRF, see: <https://www.fema.gov/national-response-framework>; and the NECP, see: <https://www.dhs.gov/national-emergency-communications-plan>.

2. Findings

Overall, public safety agencies serving border communities in both rural and urban areas are working to enhance interoperability across all elements of the Interoperability Continuum, resulting in high levels of domestic and international coordination throughout the border region. OEC found that public safety agencies in rural areas tended to field and operate simpler and more informal interoperability processes and solutions (e.g., informal coordination between agencies, radio swapping, gateway devices) reflecting the size of population served and number of emergency responders serving the area. In comparison, public safety agencies in urban areas tended to operate at more advanced levels of interoperability (e.g., multi-discipline coordination on regular basis, shared channels, standards-based systems), given the increased number and complexity of communication needs within the area. Regardless of whether a border community is predominantly rural, urban, or a mix, BIDP recipients recognized they must consider and make improvements in all Interoperability Continuum elements to achieve interoperable communications.

The following sub-sections include descriptions of the Interoperability Continuum elements, best practices and examples of BIDP solutions corresponding to each element, and key takeaways for rural and urban areas. BIDP recipients identified these solutions to assist other border communities in overcoming challenges, such as the need for common procedures, shared assets, and joint training and exercises. Note, this study is based on BIDP lessons learned in selected border communities. Public safety agencies should adjust solutions to fit their community's unique circumstances.

Governance

Governance structures provide the framework in which communities can collaborate and make decisions that represent a common objective. It has become increasingly clear to the emergency response community that interoperable communications cannot be solved by any one entity; achieving interoperability requires a partnership among public safety agencies across all levels of government. As such, a governing body should consist of federal, state, local, and tribal agencies, as well as other entities that have a role in emergency response (e.g., public health, transportation agencies, critical infrastructure sectors). In border regions, governing bodies have the added complexity of coordinating with international counterparts to establish mutual aid agreements, policies, and common operating procedures.

BIDP Best Practice: Formalize international agreements. BIDP recipients in rural areas recognized that formal agreements with international partners were necessary to lay the foundation for sustainable communications interoperability improvements. These agreements formalized cooperation among public safety agencies, established mutual aid plans for day-to-day incidents and emergencies, and allowed for shared use of designated interoperability channels, as described in the following examples:

- In Maine, participating agencies elevated “handshake” agreements by negotiating a Memoranda of Understanding (MOU) and establishing standard operating procedures (SOP) with Canadian counterparts for operations on each side of the border. These agreements allowed Maine to install radios at border crossings, regional dispatch centers, and in

emergency response vehicles to facilitate reliable, interoperable communications across domestic and international partners.

- In Montana, cross border cooperation had been limited to area agreements between Canadian and U.S. public safety agencies with virtually no framework in place for common cooperation. For its BIDP project, Montana hosted four meetings to discuss a cooperative framework that would support joint use of a designated interoperability channel. As a result, Canada established a licensing process so that Canadian public safety agencies could use the channel within 16 kilometers (10 miles) of the border in four provinces. To achieve this, Montana overcame international policies and a legal definition of two-way communications that had been in place since 1952. Canada and the Federal Communications Commission established a joint statement of intent that redefined terminology and made it legal to use handheld radios in cross border communications.

Rural areas typically have fewer public safety agencies and other entities to coordinate on governance as compared to urban areas. This may lead to more instances of or greater reliance on informal partnerships and handshake agreements among certain individuals to support mutual aid operations as needed. While such arrangements are effective, informal partnerships and agreements are at risk as personnel change or priorities shift (e.g., evolving requirements, adjusted investment strategy, impact of fielding new interoperability solutions). Whether rural or urban area-based, all public safety agencies should strive to establish a formal governance structure and sign agreements to recognize roles and responsibilities. In border regions, agencies must extend governance to include international agencies, which may require coordination with the U.S. Department of State or other federal entities to facilitate any international treaties or policies.

Standard Operating Procedures

SOPs are formal written guidelines or instructions for incident response, which typically have both operational and technical components. Established SOPs enable emergency responders to successfully coordinate an incident response across disciplines and jurisdictions. Public safety agencies should regularly review and update SOPs to reflect new capabilities or users.

BIDP Best Practice: Develop regional SOPs and Tactical Interoperable Communications Plans (TICP). BIDP recipients in rural and urban areas sought to develop or update regional SOPs and TICPs so that procedures reflected new partnerships and capabilities funded by the grant. These plans ensure the proper use of communications capabilities and the transfer of knowledge when personnel changes occur, as described in the following examples:

- In Michigan, partnering agencies addressed governance fundamentals and developed an MOU, regional group charter, and interoperability committee by-laws. Once the governance organization was in place, agencies developed shared regional SOPs. The resulting regional, NIMS-integrated SOPs and planning documents moved the community to the desired end-state of the Interoperability Continuum's SOP element.
- In Arizona, the City of Yuma conducted two SOP workshops with partnering agencies to create procedures for expanded capabilities of the regional radio system, including the newly installed computer aided dispatch and geographic information system. The resulting SOPs expanded on basic procedures already in use across the metropolitan area. Arizona tested the

region's county dispatch communications centers, including four local centers and two federal centers, during one of its four functional exercises. This exercise successfully demonstrated the dispatchers and emergency responders' knowledge of the new capabilities and SOPs.

- In Montana, U.S. and Canadian public safety officials developed two comprehensive SOPs and a regional TICP for the rural northern border. The initial SOP included policies and procedures for the shared use of an interoperability channel, with consideration of frequency licensing, system coverage, border patrol procedures, and mutual aid response plans. Following a large-scale functional exercise, participants recommended the development of a second SOP for mutual aid procedures and radio use, as well as a regional TICP focused on Flathead County. These SOPs and TICP have been developed and incorporated into normal operating procedures across Montana's public safety agencies.

SOPs are critical in both rural and urban areas. Lack of clear SOPs results in risks, such as users' inability to access communications capabilities, which adversely impacts incident response if agencies are unable to interoperate. Furthermore, public safety agencies must regularly train and exercise on SOPs to test users' awareness and knowledge of procedures. The development and testing of regional SOPs across agencies may be more complex in an urban area given the likelihood for more organizations to be involved; however, this does not negate the need to plan for and maintain SOPs.

Technology

Technology is a critical tool for improving interoperability, but it is not the sole driver of an optimal solution. Successful implementation of data and voice communications technologies is supported by strong governance and is highly dependent on effective collaboration and training among participating agencies. The technologies described within the Interoperability Continuum must be scalable in order to effectively support day-to-day incidents and large-scale disasters. Many times, a combination of technologies is necessary to provide secure interoperable communications among emergency responders.

BIDP Best Practice: Extend public safety capabilities in weak or underserved coverage areas. BIDP recipients identified projects that extended system coverage and services to rural areas. Solutions included various technologies that provided access to existing regional systems through deployable assets and established backup or temporary communications, as described in the following examples:

- In California, partnering agencies deployed mobile command centers, installed six downlink receiver sites, and pre-positioned subscriber kits, which improved network coverage and increased reception upwards of 75 percent. In areas not covered by San Diego's regional communications system, microwave radios are used to create network access points. The subscriber kits offer several applications in both temporary and emergency network connections. These kits have proven useful for creating immediate network connectivity where critical infrastructure has been lost. California has since reported that subscriber kit connections have ranged from single-day incidents to prolonged use over several weeks. Previous challenges, such as loss of video during helicopter maneuvers and dead spots in the region, have been effectively eliminated.

- In Maine, partnering agencies enhanced statewide capabilities by installing the record management system and radios into several of Maine’s aircraft. The aircraft are able to communicate with local emergency responders during an incident or act as repeaters for responders in remote regions that are still without coverage. As a result, Maine established reliable, interoperable communications across domestic and international partners.

Public safety agencies in rural areas often need a level of operable and interoperable emergency communications similar to those available to their urban counterparts. These capabilities may include the enhancement of existing systems to add capacity, coverage, and features, and may incorporate new or emerging technologies designed specifically for rugged environments. However, due to the sparse population or difficult terrain of rural areas, the per-unit cost is more expensive for commercial service providers and equipment vendors to offer services and products. Service providers and equipment vendors must decide whether to forgo improving communications in the rural area or raise prices to offset the costs involved with servicing a small pool of customers. Consequently, rural agencies may not have access to the same array of commercial options available to agencies in more densely populated areas and may have to develop their own public safety communications solutions.

BIDP Best Practice: Deploy advanced data capabilities to complement traditional voice communications. BIDP recipients in urban areas had existing operability and some interoperability with partners, but needed to employ more advanced capabilities in order to close coverage gaps, increase reliable interoperable communication, and improve situational awareness, as described in the following examples:

- In Ohio, partners implemented a project to interlink several radio systems in the northern Ohio region that borders Lake Erie, to include statewide systems in Michigan and Pennsylvania, and the systems for two urban areas, Toledo and Cleveland, Ohio. Using radio frequency inter-subsystem interface technologies, Ohio created a “system of systems” that provides interoperable voice and data communications between numerous agencies. In addition, Ohio added three radio channels to Lake County’s existing radio system and the statewide system. Ohio also purchased and distributed portable radios and control station interfaces to the area’s law enforcement agencies, and installed dual-band radios in Lake Erie’s law enforcement watercraft. These improvements enabled interoperable communications among public safety agencies, with 98 percent portable radio coverage in maritime regions.
- In Texas, the City of McAllen expedited the flow of information from regional emergency responders to three ports of entry by implementing a mass notification text messaging system. Previous capabilities limited communications between individual responders, while text messaging pushes information to multiple responders, enabling faster response to border incidents. The text messaging system provides visual and audible alerts to ensure responders see and acknowledge receipt of the message. This added capability improves situational awareness and incident response at border crossings.
- In Michigan, counties in the Lake Erie region had previously lacked reliable access to the statewide radio system. Michigan addressed these coverage gaps by upgrading a communications tower and installing Internet Protocol-based communications within the passenger Detroit–Windsor tunnel. In addition, Michigan deployed dual-band radio caches

and established talkgroup channels with agencies on both sides of the border. Michigan then trained participants on new technologies and gateway devices, which enable dispatchers or incident managers to communicate with other dispatch personnel and field units, including the use of audio and video streams within a secure network. Through these new capabilities, Michigan is better prepared to coordinate multiple agencies—domestic and international—responding to a large-scale event.

Rural and urban areas along the border contain multiple ports of entry where domestic and international responders need situational awareness of mutual aid activities. Agencies that monitor and control traffic at border crossings need to quickly process and allow access to emergency responders. This is especially relevant in communities where the closest responders may be on the other side of the border, which may be the case in either rural or urban areas.

Training and Exercises

Implementing effective training and exercise programs to practice interoperable communications is essential for ensuring that the technology works and responders are able to effectively communicate during emergencies. OEC required BIDP recipients to execute a functional exercise to demonstrate the deployed technologies purchased with grant funds. OEC supported this requirement by providing exercise design experts and evaluators to each community, assisting with the design, planning, execution, and evaluation of these functional exercises.

BIDP Best Practice: Conduct functional exercises to validate solutions and identify additional needs. BIDP recipients conducted functional exercises focused on communications capabilities. The exercises aligned to the overall BIDP goal, included participation from at least 80 percent of project partners, involved the Statewide Interoperability Coordinators, tested new capabilities across elements of the Interoperability Continuum, and validated performance measures. Following the exercises, participants identified any issues with the interoperability solutions, such as coverage gaps or incomplete mutual aid procedures. This allowed communities to address the issues before finalizing BIDP projects, as described in the following examples:

- In Maine, participating agencies held two exercises, each focused on different regions, to demonstrate BIDP capabilities. The first functional exercise evaluated expanded coverage and newly installed communications equipment, including the air-to-ground technologies in Maine's aircraft. Maine demonstrated enhanced use of a designated interoperability channel and significantly improved coverage into Canada, enabling reliable communications during international mutual aid response. Following the exercise, participants recommended expanding the statewide and regional radio systems, increasing use of shared channels, and continuing to train users on new mobile and portable radios. During the second exercise, Maine participated in Exercise Intrepid 2015, which focused on a scenario involving a Canadian nuclear power plant and consisted of approximately 1,500 participants from more than 30 agencies. Maine demonstrated exceptional interoperability among domestic and international partners, as well as redundancy and the reliability of communications throughout the border area.
- In Montana, U.S. and Canadian public safety agencies held a functional exercise to test interoperable communications across all levels of government from various locations

throughout northern Montana border region. Following the exercise, participants recommended an additional communications site, the development of a regional TICP, and continuous standardized training to ensure users understand new capabilities and follow SOPs. Participants also recommended expanding automatic vehicle location software installation to more vehicles and increasing dispatcher engagement for future exercises. Montana incorporated all of these recommendations into its BIDP project.

- In Ohio, partners successfully demonstrated BIDP-funded investments during two full-scale functional exercises and one smaller exercise. Ohio's first exercise goal was to evaluate users' ability to demonstrate the new vessel tracking software. Following the exercise, participants recommended continuous training and exercises for boat crews, equipment upgrades for better usability, and the creation of SOPs to outline vessel tracking system functions. Ohio contracted for additional training to law enforcement boat crews and held a second exercise to gauge improvements in operational capabilities following additional training. Finally, Ohio conducted a third waterborne exercise to demonstrate the functioning and viability of the vessel tracking system.

While training and exercises are needed in both rural and urban areas, border communities should consider their needs when planning the frequency and scope of exercises. Public safety agencies in rural areas should plan and design comprehensive training and exercises as they may have fewer opportunities to hold events in sparsely populated regions. With a lower frequency and considering the resources and time it takes to execute, it is important that the training or exercise is well-coordinated and includes all relevant participants in order to optimize its value. In comparison, public safety agencies in urban areas may implement a more iterative approach to training and exercises, in which each focuses on a particular area or builds on the outcomes of the previous event. Regardless of the frequency or number of participants, agencies in rural and urban areas should both develop after-action reports to document results and identify actions to continue improving interoperable communications.

Usage

Usage refers to how often interoperable communications technologies are used. Success in this element is contingent upon progress and interplay among the other four elements on the Interoperability Continuum. In border regions, the desired end state for daily use of interoperable communications necessarily includes domestic and international partners due to the overlapping public safety responsibilities along and across the border.

BIDP Best Practice: Expand coverage and use of shared systems. BIDP recipients increased coverage and users' access to regional communications systems in rural and urban areas. Solutions expanded use to domestic agencies at all levels of government—federal, state, local, and tribal. In some instances, interoperability solutions included international agencies, either through the shared use of interoperability channels or direct interfaces between communications systems. Furthermore, the southern border communities prepared for connection to the Cross Border Security Communications Network (CBSCN), an international public safety network between the U.S. and Mexico to improve border security and combat border violence, as described in the following examples:

- In Arizona, the City of Yuma added users to the existing regional radio system and prepared for integration of its state emergency operations center to the CBSCN. Arizona expanded Yuma’s regional system and integrated additional federal, state, local, and tribal public safety agencies. Many of these added agencies transitioned to the system for all operations. To prepare for direct interface with international counterparts, Arizona drafted and submitted SOPs for accessing the CBSCN to U.S. Customs and Border Protection (CBP). Following CBP’s approval of the SOPs, Arizona plans to install necessary equipment and connect the networks in 2017.
- In California, San Diego’s existing regional network provided voice and data capabilities that covered the densely populated area, but did not adequately cover the rugged border region. To address this coverage gap, California extended the network’s capabilities by obtaining licenses for new frequencies, adding a microwave site, and installing microwave equipment at a CBP communications facility. The new frequencies and equipment established dedicated voice and data capabilities between CBP and the regional network’s other 26 member agencies. The CBP connection also prepares San Diego agencies to connect to the forthcoming CBSCN.
- In Texas, the City of McAllen expanded coverage and site capacity of an existing regional system, and also connected to a disparate radio system in a neighboring county. The new equipment resolved coverage gaps, expanded capacity to add users, and introduced interoperability capabilities for federal, state, and local agencies throughout the Lower Rio Grande Valley region. These improvements moved the community to the desired end state on the Interoperability Continuum to operate a regional, standards-based system. The system is also primed to connect to the CBSCN when safety and security concerns with Mexican counterparts have been addressed.

Daily use of interoperable communications with international agencies varies based on the rural or urban area in question. In general, agencies in urban areas have more frequent opportunities to use interoperable communications than agencies in rural areas. However, agencies operating in rural areas may be more dependent on international counterparts to provide mutual aid services if the other side of the border is more densely populated. Communications solutions should meet the border communities’ needs and encompass all elements of the Interoperability Continuum.

3. Conclusion

A fundamental finding of this study is that BIDP best practices are widely applicable to both rural and urban border communities seeking to enhance their interoperable communications capabilities. While certain best practices may yield different benefits or value to specific communities, none are exclusively applicable to only rural or urban areas. Conversely, rural and urban border communities can greatly benefit from reviewing the experiences and lessons learned from those BIDP recipients that share similar geographies, operating environments, or population densities. Figure 3 summarizes the BIDP best practices described in this study that are applicable to all public safety agencies, whether they operate in either rural or urban areas.

Figure 3. BIDP Best Practices aligned with the Interoperability Continuum

Interoperability Continuum Element	BIDP Best Practice
Governance	<ul style="list-style-type: none"> • Formalize international agreements
SOPs	<ul style="list-style-type: none"> • Develop regional SOPs and TICPs
Technology	<ul style="list-style-type: none"> • Extend public safety capabilities in weak or underserved coverage areas • Deploy advanced data capabilities to complement traditional voice communications
Training & Exercises	<ul style="list-style-type: none"> • Conduct functional exercises to validate solutions and identify additional needs
Usage	<ul style="list-style-type: none"> • Expand coverage and use of shared systems

Another universal finding of BIDP projects is that public safety agencies must continue improving interoperability along and across the U.S.–Canadian and U.S.–Mexican borders. OEC-administered stakeholder groups are a valuable resource to help public safety agencies expand their networks and connections with like-minded agencies. For example, the Southwest Border Communications Working Group sponsors quarterly meetings that rotate throughout the four states in the southwest region, encompassing discussions and activities of interest to both rural and urban agencies.

In coordination with these stakeholder groups, OEC publishes numerous policies and guidance documents. Publications include the Interoperability Continuum referenced in this study, as well as documents aimed at the five elements of the Continuum. For example, there are guides for various levels of planning within the SOP element—the NECP as the national strategy for emergency communications, the Statewide Communication Interoperability Plan Methodology for states, and SOP and TICP development guides for tactical-level operations.

OEC also administers a number of programs (e.g., regional coordinators, technical assistance, priority telecommunications services) that are available to state, local, tribal, and territorial public safety agencies to help establish or advance interoperable communications in border regions. Service offerings includes the development and delivery of training, tools, and onsite assistance. This support may be tailored to meet the individual needs of a border community, similar to the technical assistance provided to selected BIDP communities.

[Appendix B](#) lists OEC-administered programs, services, and federal publications that exist as resources for public safety agencies. For questions on BIDP or this study, please contact OEC.³

³ Contact OEC at: OEC@hq.dhs.gov.

Appendix A. Border Interoperability Demonstration Project Background

To address the critical need for interoperability along and across international borders, the *Implementing Recommendations of the 9/11 Commission Act of 2007* (Pub. L. No. 110-53) authorized the Department of Homeland Security (DHS) Office of Emergency Communications (OEC) to establish the Border Interoperability Demonstration Project (BIDP) to identify solutions that facilitate emergency communications in border areas and ensure emergency response providers can communicate during natural disasters, acts of terrorism, and other man-made disasters. BIDP was a \$25.5 million one-time, competitive program to provide funding and technical assistance to U.S. communities along the Canadian and Mexican borders.⁴ The legislation authorized DHS to select no fewer than six communities (at least three along the U.S.–Canadian border and at least three along the U.S.–Mexican border) for participation in the demonstration project, to provide technical assistance to the selected communities, and to share information among BIDP participants and other interested parties.

DHS selected seven projects that demonstrated innovative solutions and met both statutory and program guidance requirements (Figure A-1).⁵ The selected projects tested approaches that involved new technologies or an innovative approach to governance, planning, coordination, training and exercises. The projects served as repeatable models for other border communities to achieve greater communications interoperability with domestic and international agencies. OEC worked with BIDP award recipients to document lessons learned, capture challenges and successes, and share information with the emergency response community throughout the process. See the [BIDP Closeout Report](#) for additional information.

Figure A-1. Selected Projects

State	Lead Sub-Recipient	Project Title	Funding Allocation*
Arizona	City of Yuma	Yuma Full Voice and Data Integration Demonstration Project	\$3,994,443
California	San Diego Fire-Rescue	Regional Command and Control Communications Tactical Border Communications Project	\$3,852,580
Maine	County of Washington	Enhanced Communications Infrastructure and Partnerships for Border Security Project	\$3,963,163
Michigan	Wayne County	Southeast Michigan Border Interoperability Solution Project	\$4,000,000
Montana	Flathead County	Northern Tier Consortium Border Interoperability Demonstration Project	\$3,895,425
Ohio	Lake County	Multi-Agency, Multi-Jurisdictional U.S. Regional & International Interoperable Communications Infrastructure and Maritime Domain Awareness Project	\$3,998,200
Texas	City of McAllen	Rio Grande Valley Border Interoperability Regional Project	\$1,940,000
			\$25,643,811

**In accordance with the BIDP Funding Opportunity Announcement (page 2), OEC determined to provide approximately \$145,000 more in BIDP awards, in addition to the \$25.5 million.*

⁴ For additional information, see the BIDP website at: <https://www.dhs.gov/border-interoperability-demonstration-project>.

⁵ <https://www.dhs.gov/news/2011/04/29/secretary-napolitano-announces-funding-strengthen-interoperable-emergency>.

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Figure A-2 provides a summary of the interoperability solutions implemented in the seven BIDP projects.

Figure A-2. Summary of BIDP Projects

State	Interoperability Solutions
Arizona	<ul style="list-style-type: none"> ● Expanded the Yuma Regional Communications System by increasing federal, state, local, and tribal participation and adding data capabilities ● Prepared for future connectivity with international partners through the U.S.–Mexico Cross Border Secure Communications Network ● Demonstrated new capabilities during four functional exercises
California	<ul style="list-style-type: none"> ● Enhanced the Regional 3Cs network and added U.S. Customs and Border Protection ● Enabled the ability for mobile and temporary communications across the region ● Demonstrated new capabilities during a functional exercise
Maine	<ul style="list-style-type: none"> ● Built and leased communications towers, installed radio equipment, and deployed mobile and portable radios to improve coverage to nearly 100% of border ● Coordinated use of national interoperability channel, formalized agreements, and established resource sharing practices with agencies on both sides of border ● Demonstrated new capabilities in two functional exercises
Michigan	<ul style="list-style-type: none"> ● Upgraded existing radio infrastructure to improve coverage across the U.S. and into Canada ● Installed Internet Protocol-based communications infrastructure in the Detroit–Windsor tunnel ● Improved cross border protocols by creating standard operating procedures and designated talkgroups ● Demonstrated new capabilities in a functional exercise
Montana	<ul style="list-style-type: none"> ● Expanded a cross border interoperability channel for public safety use within 16 kilometers of the border ● Provided a framework for international mutual aid agreements and frequency coordination ● Enhanced voice and data capabilities at border crossing stations and incorporated Automatic Vehicle Location within select vehicles to provide situational awareness in rural areas ● Demonstrated new capabilities during a functional exercise
Ohio	<ul style="list-style-type: none"> ● Consolidated four disparate radio systems into one system capable of interoperable voice and data communications ● Upgraded infrastructure and achieved portable radio coverage nearing 98% across Ohio’s international border ● Implemented a Vessel Tracking System in Lake Erie to enhance maritime situational awareness ● Demonstrated new capabilities during a functional exercise
Texas	<ul style="list-style-type: none"> ● Connected disparate radio systems using Motorola’s “Smart X” technology ● Implemented a border Point of Entry text alert system ● Expanded coverage and capacity of regional radio system ● Demonstrated regional improvements through a functional exercise with 42 participants from 27 agencies

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Appendix B. Resources

The Department of Homeland Security (DHS) Office of Emergency Communications (OEC) offers numerous programs and services to state, local, tribal, and territorial public safety agencies to help establish or advance interoperable communications. Figure B-1 lists these resources, including points of contact, governance organizations, and technical assistance programs. Figure B-2 lists federal publications that guide national level preparedness strategies, as well as SAFECOM documents, including the Interoperability Continuum that outlines the five interdependent elements to achieving interoperability described in this study. For additional information on OEC programs and federal publications, visit the corresponding websites.

Figure B-1. Resources

Resource	Description	Website
Department of Homeland Security (DHS) Office of Emergency Communications (OEC)	OEC can assist agencies in cross border frequency coordination upon request. OEC offers grant guidance, technical support, standards assistance, and opportunities to connect with other first responder agencies and land mobile radio users. OEC has published numerous guidance documents on interoperable emergency communications.	https://www.dhs.gov/office-emergency-communications
OEC Regional Coordinators	OEC has subject matter experts located across the country to assist states in addressing interoperable communications activities and challenges. Regional Coordinators assist in collaboration, provide resources and best practices, and can act as a liaison between federal agencies and state and local entities.	https://www.dhs.gov/oec-regional-coordination-program
Statewide Interoperability Coordinator (SWIC)	The SWIC serves as the state's single point of contact for interoperable communications and implements the Statewide Communication Interoperability Plan in coordination with the state's governing bodies. OEC strongly encourages all jurisdictions coordinate communications projects with the SWIC to ensure that projects support statewide efforts to improve emergency communications.	To find the SWIC for your state or territory, contact: OEC@hq.dhs.gov
Canada–United States Communications Interoperability Working Group (CANUS CIWG)	Created in 2012, OEC co-facilitates the CANUS CIWG with Public Safety Canada. The working group seeks to enhance cross border communications interoperability between Canadian and American first responders and emergency management organizations and facilitate the seamless movement of both information and resources across the border.	Contact: CANUSCIWG@hq.dhs.gov
Southwest Border Communications Working Group (SWBCWG)	The SWBCWG serves as a forum for federal, state, local, and tribal agencies in Arizona, California, New Mexico, and Texas to share information on common communications issues; collaborate on existing and planned activities; and facilitate federal involvement in multi-agency projects within the Southwest Border Region.	Contact: SWBCWG@hq.dhs.gov
OEC Interoperable Communications Technical Assistance Program	OEC's technical assistance program serves all 56 states and territories and provides direct support to state, local, tribal, and territorial emergency responders and government officials through the development and delivery of training, tools, and onsite assistance to advance public safety interoperable communications capabilities.	https://www.dhs.gov/oec-technical-assistance-program
OEC Priority Service Programs	OEC collaborates with the public and private sectors to ensure the national security and emergency preparedness communications community has access to priority telecommunications and restoration services to communicate under all circumstances. OEC manages the Government Emergency Telecommunications Service, Wireless Priority Services, Telecommunications Service Priority, and Next Generation Network Priority Service programs.	https://www.dhs.gov/oec-communications-portfolio-management

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Figure B-2. Federal Publications

Resource	Description	Website
National Incident Management System (NIMS)	The NIMS is a systematic, proactive approach to guide agencies at all levels of government, non-governmental organizations, and the private sector to work together seamlessly and manage incidents involving all threats and hazards—regardless of cause, size, location, or complexity—in order to reduce loss of life, property, and harm to the environment. The NIMS is the essential foundation to the National Preparedness System and provides the template for the management of incidents and operations in support of all five National Planning Frameworks.	https://www.fema.gov/national-incident-management-system
National Response Framework (NRF)	The third edition of the NRF, updated in 2016, provides context for how the whole community works together and how response efforts relate to other parts of national preparedness. It is one of the five documents in a suite of National Planning Frameworks. Each Framework covers one preparedness mission area: Prevention, Protection, Mitigation, Response, or Recovery.	https://www.fema.gov/national-response-framework
National Emergency Communications Plan (NECP)	The 2014 NECP provides information and guidance to those that plan for, coordinate, invest in, and use operable and interoperable communications for response and recovery operations. OEC worked closely with more than 350 federal, state, local, tribal, and territorial jurisdictions, private sector representatives, and other stakeholders to update the NECP with the goal of bringing public safety communications into the 21st century. To address the rapidly evolving emergency communications landscape, the NECP emphasizes the need to enhance and update the policies, governance structures, plans, and protocols that enable responders to communicate and share information under all circumstances. As a stakeholder-driven plan, the NECP aims to maximize the use of all communications capabilities available to emergency responders—voice, video, and data—and to ensure the security of data and information exchange.	https://www.dhs.gov/national-emergency-communications-plan
SAFECOM Documents, including the Interoperability Continuum	Through collaboration with emergency responders and elected officials across all levels of government, SAFECOM works to improve emergency response providers' inter-jurisdictional and interdisciplinary emergency communications interoperability across local, regional, tribal, state, territorial, international borders, and with federal government entities. The SAFECOM website provides members of the emergency response community with resources created by SAFECOM and its partner organizations to improve public safety interoperability. It offers comprehensive information on topics relevant to emergency response communications and features best practices that have evolved from real-world situations.	https://www.dhs.gov/safecom/

Appendix C. Acronyms and Abbreviations

BIDP	Border Interoperability Demonstration Project
CANUS CIWG	Canada–United States Communications Interoperability Working Group
CBP	U.S. Customs and Border Protection
CBSCN	Cross Border Security Communications Network
DHS	Department of Homeland Security
MOU	Memorandum of Understanding
NECP	National Emergency Communications Plan
NIMS	National Incident Management System
NRF	National Response Framework
OEC	Office of Emergency Communications
SOP	Standard Operating Procedures
SWBCWG	Southwest Border Communications Working Group
SWIC	Statewide Interoperability Coordinator
TICP	Tactical Interoperable Communications Plan