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Congressional Hearing Testimony
**COMMITTEE ON HOMELAND SECURITY**
U.S. House of Representatives

**"Public Safety Communications: Are the Needs of Our First Responders Being Met?"**
Wednesday, March 30, 2011 at 10 a.m.
311 Cannon House Office Building

Hon. Members of the Committee on Homeland Security:

Thank you for allowing me to share my thoughts on the critical issue your question captures, "Are the public safety communications needs of our first responders being met?" The short answer: Not yet. But, we are making good progress.

County and local governments in Los Angeles County (LA County) are moving forward to build a radio voice system and a broadband data system that will allow them to seamlessly coordinate their responses to regional emergencies, as well as enable them to more effectively carry out their day-to-day operations.  County and municipal agencies are working through the governance, financing, operating and policy issues that are often more challenging than the technical ones.

As the Committee on Homeland Security has been advocating, tremendous opportunities for improved public safety communications lie in three areas:

- **Interoperability.** Interoperability allows first responders to exchange voice or data wirelessly on demand, in real time, with appropriate physical and cyber security. In a major natural disaster or terrorist incident, interoperability will mean the difference between lives lost and lives saved: the lives of first responders, and the lives of those they serve. This was one of the major lessons learned following 9/11.

- **Wide area coverage.** Wide area coverage allows first responders to remain in touch with their home base, even if having to operate well outside their home territory. Police officers especially appreciate this feature.

- **Broadband data.** Broadband data will allow first responders to go well beyond exchanging text messages or doing license checks, which represent the great majority of data transmissions today. It will go beyond receiving graphics, as useful as that will be. Broadband will allow streaming video on-scene and downloaded plans for a burning building, an example President Obama gave in his 2011 State of the Union address.

An integrated system making use of all three of these capabilities would go very far toward making our public safety communications equal to the challenges posed by natural disasters and terrorist incidents in major metropolitan areas.

Now I'd like to discuss several topics with you:

- **Federal guidance needed to spur development of the "communications highway".** Renewing the nation's communication infrastructure without breaking the bank, overcoming operational barriers, reallocating the 700 MHz D Block, ensuring cyber security, and coordinating spectrum needs for Smart grid operations.

- **A brief overview of public safety operations.** Interoperability arising from wide-area operations, the need to include agencies providing logistical support.

- **LA County is grappling with a huge public safety communications challenge.** Huge populations scattered over many agencies, geographically diverse, target rich.

- **The LA-RICS response.** Coming to grips with the challenge of creating a countywide, integrated voice and data system for first responders.

- **The ICIS response.** Independent cities banded together and created a regional voice interoperable network.

And then I'll offer some concluding remarks that will recap the most important action items.

## FEDERAL GUIDANCE NEEDED TO SPUR DEVELOPMENT OF THE "COMMUNICATIONS HIGHWAY".

Before focusing on the public safety communication within LA County, it may be helpful to point out the federal support that is needed for the public safety communications throughout the nation:

- Renewing the nation's communications infrastructure, transforming it into "highways" of interoperable voice and data networks, but without breaking the bank.

- Overcoming operational barriers.

- Reallocating the 700MHz D Block

- Ensuring the cyber security of the public safety communications grid.

- Coordinating spectrum for Smart Grid initiatives with that needed for public safety communications.

The overarching challenge is to successfully translate recent technological advances into viable infrastructure that supports our first responders.

*Renewing the nation's communications infrastructure, transforming it into "highways" of interoperable voice and data networks, without breaking the bank.* We need to renew our communications infrastructure as much as we need to repair roads and bridges, replace water mains and rebuild power lines. The "information highway", while perhaps an overused phrase, does invite

an analogy with the interstate highway system, a triumph of post-WWII federal initiative. However, attempting to build a national system all at once could be a formidable challenge.

A more feasible approach would be to adopt federally the "systems-of-systems" approach embraced by the State of California. It would require the widespread use of multimode (analog, digital, conventional, trunked) and multiband (VHF, UHF, 700 MHz, 800MHz) radios. Fortunately, several manufacturers (Harris, Guardian, Motorola, Thales) have begun to manufacture them.

As importantly, each system must commit to be interoperable with the others. Through various mechanisms, the federal government could offer grants specifically for the purpose of achieving system interconnection. The federal government needs many agencies to be simultaneously working on their pieces of the national network—but they all have to connect together.

***Overcoming operational barriers.*** The P-25 standards substantially address the technical challenges of communication among differing modulation schemes: conventional, trunked and analog systems. But substantial operational barriers remain. Agencies must allow others to come onto their dispatch channels. (And note: Thanks to P-25, with its use of individual ID's, spoofing is much harder.) SAFECOM could review its training standards with the goal of setting this as an expectation. Much work at the local levels will still be needed to change long-standing cultural attitudes.

***Reallocating the 700 MHz D Block.*** We fully support reallocating the D Block for public safety. Concerns about how to attain the revenue (estimated at $1.5 to 3.2 billion) that would have come from auctioning the D Block are understandable, given that Congress had already accounted for this revenue. However, auctioning the public safety spectrum below 512 MHz, as proposed in H.R. 607, would be highly problematic for LA County. The UHF channels for voice interoperability are all under 512 MHz.

***Ensuring the cyber security of the public safety communications grid.*** The general advances in digital and communication technologies that have made cell phones possible have also made radio interoperability much more feasible, even in the absence of common frequency bands.

Inherently, a radio system's use of computers and sophisticated software opens the door to cyber attack. Interoperable systems are more vulnerable to such attacks owing to their greater interconnectedness. The federal level is best equipped to set cyber security standards that help determine if existing encryption schemes are adequate.

***Coordinating spectrum for Smart Grid initiatives with that needed for public safety communications.*** In coming years, more utilities will have two-way communications with their electric meters and the customers they serve, often making use of the 700 MHz bandwidth. (Fiber optics may also be employed, but rights-of-way barriers and high installation costs will often favor a wireless approach instead.)

The federal level is best equipped to allocate enough spectrum for both Smart Grid applications and public safety communications. A guiding principle should be to protect current spectrum for Public safety until alternative technologies are fully vetted.

**BRIEF OVERVIEW OF PUBLIC SAFETY COMMUNICATIONS FROM A FIRST RESPONDER'S POINT OF VIEW.**

Even in local incidents that first responders can handle with well-defined policies and procedures, wireless voice communications are essential. Dispatchers need to alert their first responders; and the first responders, in turn, need to provide their dispatchers status updates. First responders at the scene need to speak with each other, even if out of normal voice range. Responders within a building need to communicate with nearby responders outside the building even if the radio cannot access the network; that is, the radio on occasion needs to function as a walkie-talkie.

Often, one first responder has to immediately alert many other first responders to a particular situation; most importantly, to come to the aid of injured first responders. Supporting *one-to-many communications* is therefore a crucial requirement.

Cell phones and radios are the two basic ways to achieve wireless communications. In recent years, cell phones have made their systems more reliable and resilient, and have improved and extended their coverage. They also provide seamless communications among their users. But for first responders, cell phones still fall short in a crucial area: instantaneous one-to-many communications when fleet wide situational awareness is needed. They are too slow and reach too few people in this particular instance. For at least one more technological cycle, radios will remain the communications medium of choice for first responders.

Cell phones can be a valuable supplement to first responder communications, and it is likely that future developments will see cell phones and radios integrated in one device. Also, cell phones are coming into widespread use among non-safety city operations, where one-to-many communications are not as important. But, non-safety operations would need to retain enough radios to communicate with first responders during an emergency.

*Communication needs arising from first responders' wide area operations.*

Communications must also support responses to incidents that extend over a wide area or that occur outside the first responders' normal service territory: A police officer serves a warrant in another jurisdiction, and the person served threatens to turn violent. Meanwhile, other police officers raid a desert meth lab far from their jurisdiction; and still others pursue a fleeing suspect through several cities.

A mountain wildfire mushrooms, triggering a coordinated response from several different fire fighting agencies. A hazardous material spill occurs on a stretch of Freeway, prompting an emergency shutdown of the affected portion of the freeway.

In these examples, the need for two communication capabilities becomes apparent: wide-area coverage and interoperability. Wide area coverage and interoperability can have an especially great impact on the number of lives first responders can save--including their own--when they are grappling with regional emergencies: a major earthquake hits Southern California; a freight train derails and releases hazardous gases; a terrorist cell succeeds in releasing a dirty bomb.

As first responders know too well, regional disasters unfold rapidly and unpredictably, requiring

responses measured in seconds. Without interoperability, whole *minutes* could pass as a dispatcher or other third party connects first responders from different agencies.

In a regional disaster, many agencies activate their Emergency Operations Centers, where diverse agency departments come together and coordinate their responses under an Incident Command System. Interoperability would make such communications more efficient, especially at the field level.

***The need to communicate with those providing logistical support.*** Regional disasters highlight the need for rapid logistical support from non-first responder agencies; for example, heavy equipment to assist with search-and-rescue operations, or a diesel generator to power an emergency shelter until normal power returns. Without power, serviceable roads and other resources, first responders will be greatly limited in their ability to respond.

Logistical and inter-agency support is also needed in many lesser, day-to-day incidents:

- Fire fighters need the electrical power cut to a burning building to forestall electrocution hazards.

- Police officers need traffic cameras to track the movements of a fleeing suspect.

- Fire fighters may need to bulldoze a new firebreak. Police officers may need to barricade several streets.

- A local police department and airport security mount a coordinated capture of a would-be thief in the airport's parking lot.

Bear in mind that most police and fire departments are too small to contain their own logistical support, such as heavy equipment or emergency generators. They depend on public works departments; water, gas and electric utilities; and the Red Cross and like agencies.

Interoperability should extend as well to those that can be especially impacted by an incident, such as a school district, a major sporting venue (like the Staples Center), a major industrial site (like an oil refinery), and an airport (like the Van Nuys Airport). Often, those impacted by an incident may also be able to serve as a resource; e.g., as an evacuation center.

**LA COUNTY IS GRAPPLING WITH A HUGE PUBLIC SAFETY COMMUNICATIONS CHALLENGE.**
Developing an integrated public communications system within LA County is similar to developing one for a sizeable nation prone to natural disasters and an offering an attractive target for terrorists.

***Los Angeles County has a high population scattered across many agencies within a diverse geographical area.*** Los Angeles County (LA County) covers 4,084 square miles, including over 2,600 miles of unincorporated area. It has more than ten million residents: a population greater than 42 of the 50 states. It has 80 miles of coastline, 1,800 square miles of rugged mountains, expanses of

high desert, and Catalina Island.  In its size, population and geographical diversity, LA County could make a respectable country.

Within LA County are 88 cities and several unincorporated areas, served by 50 law enforcement and 31 fire service agencies, as well as paramedics and other medical first responders. LA County has over 34,000 first responders, not counting the non-safety municipal services and other logistical support.

***The Los Angeles region is designated as a high-threat area by Homeland Security.*** LA County has port facilities, international and regional airports, sports stadiums, high-profile media industries and various other critical facilities. Combine these with a huge concentrated population, and you have an attractive target for would-be terrorists. Due to California's history of natural and human-made disasters, the State divided itself into seven mutual aid regions. The Sheriff of Los Angeles County is the Emergency Coordinator for both Los Angeles and Orange Counties, which serves a combined population of over 16 million.

In LA County, the various public agency radio systems are scattered across four incompatible frequency bands using different technologies and radio equipment. Interoperability today requires exchanging radios among first responders or implementing a complex system of patches that can temporarily tie two or more radio frequencies together. Although patches have been a great help, they are cumbersome, time consuming and sometimes unreliable. The Los Angeles Regional Tactical Communications System (LARTCS) provides some ability to communicate with city, county, state and federal agencies in the event of a large-scale incident.

**THE LA-RICS RESPONSE.**
In the years following 9/11, agencies within LA County mounted two major responses to achieving an integrated, interoperable radio system:

- Los Angeles Regional Interoperable Communications Systems Authority (LA-RICS Authority, or simply LA-RICS) See www.larics.org.

- Interagency Communications Interoperable System (ICIS) Joint Powers Agency (ICIS JPA or simply ICIS) See www.icisradio.org.

As counties and other agencies seek to capture the benefits of interoperability and manage the costs, a variety of competing models has arisen. Some organizations, like LA-RICS, have adopted a model geared to a single system serving a large area, usually a county. Others, like ICIS, have adopted a model more geared to a systems-of-systems approach with different systems tailored to the needs of different types of agencies.

***Brief history of LA-RICS.*** In 2005, LA County formed a Regional Operability Steering Committee and engaged RCC Consultants to conduct a countywide radio interoperability study. RCC Consultants concluded that interoperability between public safety agencies throughout the LA County region would best be achieved through the creation of a shared, region-wide single platform voice and data radio system.

By 2009, the Los Angeles Regional Interoperable Communications Systems Authority (LA-RICS) had been established, along with a 17-member Governance Board and several standing committees, including Technical, Operations and Finance.

*LA-RICS Mission.* For voice interoperability, the mission of LA-RICS is to provide a unified voice and data communications platform for all first responders in the region. The platform will support day to day communications needs within individual public safety agencies, and also provide instantaneous communications among general agencies in the event of a man made or natural disaster.

As you know, SAFECOM is a Homeland Security program that provides research and guidance to public safety agencies on more efficient and effective interoperable communications systems. LA-RICS is committed to meeting the highest SAFECOM standards.

For data, LA-RICS' mission is to deploy LA-SafetyNet, a 700 megahertz (MHz) public safety mobile broadband network across LA County.

*The LA-RICS Model.* The LA-RICS model works best for cities unable to build their own individual system, or in a position to greatly benefit from facility sharing. Many cities are wholly dependent on LA County for their police and fire services, and use radio systems that are more than 20 years old. Especially in today's economy, many of these "contract cities" could not replace their radio systems and achieve interoperability without County assistance.

Other cities, like Los Angeles (an independent city), may find that facility sharing is especially advantageous. Also, by standardizing equipment over a wide area, LA-RICS offers uniform operations and maintenance as well as the buying leverage that comes from making large-volume purchases. Certainly there is much to be said for eliminating the duplication of costs and effort involved in maintaining separate systems.

*LA-RICS governance.* LA-RICS attempts to achieve a balance among several of its key constituencies:

- Balance between Chief Executives and Public Safety representatives.
- Relative balance between the County of Los Angles, the City of Los Angeles, as well as other independent and contract cities; and a relative balance among independent and contract cities.
- Inclusion of associations that represent member agencies that may not otherwise be members of the JPA's Board of Directors.
- Inclusion of significant non-city/county governmental stakeholders.

The resulting Board structure encompasses 17 members:

1. The City of Los Angeles City Administrative Officer
2. The City of Los Angeles Fire Chief
3. The City of Los Angeles Police Chief
4. The City of Los Angeles Chief Legislative Analyst
5. The County of Los Angeles Chief Executive Officer
6. The County of Los Angeles Fire Chief
7. The Sheriff of Los Angeles County
8. The County of Los Angeles Department of Health Services Director
9. The Los Angeles Unified School District Police Chief
10. The City of Long Beach
11. The Los Angeles Area Fire Chiefs Association
12. The Los Angeles County Police Chiefs Association
13. The California Contract Cities Association
14. At Large
15. At Large
16. At Large
17. At Large

One At Large Director (and one Alternate Director) must represent a Member city that operates both independent police and fire departments. Two At Large Directors (and two Alternates) must represent Member cities that operate at least one independent safety department (police or fire). One At Large Director (and one Alternate Director) must represent a Member city not otherwise represented on the Board.

*LA-RICS Funding-Voice.* To date, slightly over $141 million in LA-RICS funding for voice interoperability has come from the County, City of Los Angeles, and several grants from Homeland Security, State Homeland Security, the Urban Area Security Initiative and the Department of Commerce:

- *The Public Safety Interoperable Communication (PSIC) Grant, in the amount of $22,278,788.* PSIC is a one-time, matching grant program. Only planning costs are allowed under this grant, but they include engineering designs, site assessment plans and system design plans.

- *Urban Area Security Initiative (UASI) Grant, in the amount of $85,422,803; and the State Homeland Security Grant program (SHSGP), in the amount of $19,539,428.* UASI and SHSGP grants have been awarded each year since 2003. Allowable costs include plans and designs; radio equipment costs, including installation; and, subject to justification, construction of communication towers. In general, though, construction costs are disallowed.

- *Justice Assistance Grant (JAG) American Recovery and Reinvestment Act (ARRA), in the amount of $7,051,984 for the City of Los Angeles and $7,051,984 for LA County.* JAG ARRA is a one-time grant allocation for the improvement of communication sites. Sites have

been identified, and work will proceed on identified sites following the completion of the associated environmental impact reports.

In July 2008, LA-RICS had publicly estimated a system cost of $600 million for the system supporting voice interoperability. As part of its procurement process, LA-RICS has not yet used figures from the actual vendor bids; however, the $600 million remains a useful planning figure.

The funding challenge is to close the (nominal) $459 million gap between $141 million and $600 million. It will not be easy. LA-RICS has looked at various cost-allocation schemes among the cities—everyone one of them are insupportably burdensome, especially now. Going to the voters is also problematic, given the tough economy.

*LA-RICS Funding-Data.* Funding for LA-RICS' LASafetyNet broadband network is, fortunately, largely covered with the Broadband Technology Opportunities Program (BTOP) American Recovery and Reinvestment Act (ARRA) Grant, in the amount of $154,640,000. The BTOP grant is one-time and only for the broadband portion of the system. Allowable costs include, planning, equipment, project management and construction. The only disallowed costs are for operations and maintenance.

*LA-RICS progress.* In July 2008, LA-RICS had also estimated a five-year completion date, beginning in 2008 and ending in 2012. However, the five-year time frame does not start until there is a contract with a vendor. At present, bids from two major vendors (together with their associated company teams) have been evaluated, and vendor negotiations are about to start. So the time frame has shifted to 2012-to-2016.

**THE ICIS RESPONSE.**
As mentioned earlier, the Interagency Communications Interoperable System (ICIS), represents another interoperability initiative that occurred within LA County following 9/11.

*Brief History of ICIS.* In 2002, Burbank, Glendale and other cities were faced with a pressing need to replace their aging radio systems. The tragedy of 9/11 had made it very clear that public agencies had to do a better job of working together, and radio interoperability was recognized as key to achieving this goal. But, widespread radio interoperability had not yet been achieved within Los Angeles County. All municipal radio systems were functioning as islands.

Glendale, with the most urgent need to replace its system, proposed that cities replace their aging radio systems with ones that would not only be new, but interoperable as well. Burbank readily agreed; its technical staff had also appreciated the potential of interoperability. The cities' new, trunked radio systems could be linked together by employing microwave network technology at a modest incremental cost.

It rapidly became clear that an organizational framework was needed where Burbank, Glendale, and others could equitably address shared cost, cost sharing, allocation of roaming capacity, and other interagency issues. Thus came about the Interagency Communications Interoperability System Joint Powers Authority (ICIS JPA, or simply ICIS) in 2003.

*ICIS Mission.* The mission of ICIS is to provide independent Los Angeles County cities with seamless, wide-area radio voice communications among their first responders, selected targets and those providing them with logistical support. Note that establishing a broadband network is not among ICIS' goals at this time.

*The ICIS Business Model geared to independent cities.* The ICIS business model for voice interoperability tailors itself to the strengths and concerns of independent cities:

- Individual cities fund, build and maintain their own radio cells. Each city retains complete ownership and control of its own radio infrastructure.

- Under the auspices of a joint power agency, individual cities link their individual cells together to create a regional network offering wide-area coverage and seamless communications among different agencies.

- By design, individual cells would still be able to function even if the ICIS networking among them should fail. If the connection with the ICIS network is lost, each city's radio system continues to operate, merely losing the ability to roam away from its home system.

Agencies can choose to participate in ICIS under several levels of commitment, ranging from infrastructure-provider to occasional user for mutual-aid. Cities can also choose whether to restrict interoperability to first responders like police and fire, or to extend it to other departments like Water and Power or Public Works.

The advantages of the ICIS model can be considerable:

- Because each city has already built its own cell, the cost of joining these cells into a wider network is *incremental*, generally five percent or so of the cost of building a cell.

- The benefits, mainly wide area coverage and seamless communications, are significant and easy to distribute on an equitable basis.

- Cities retain local control over their cell, including its service reliability, frequency licenses. Each city still decides to what extent its radio system addresses special conditions, such as hilly terrain. Each city still decides to what extent it extends radio communication beyond first responders.

The ICIS business model can accommodate wide differences in both the timing and funding of radio cells among independent cities. By being able to wait until a particular independent city is in a position to replace its radio system, ICIS can offer interoperability on an incremental basis.

To realize the advantages offered by the ICIS business model, participating cities must be willing to exert discipline in several ways:

- Each city must fund, build and maintain its own cell.

- Each cell within the ICIS network must adopt certain standard communication protocols, and must be compatible with a modern, trunked radio system.

- Each city must closely coordinate its activities with those of the others so that radio equipment and frequency assignments are up-to-date and not in conflict.

These are not easy criteria to meet, especially having the discipline to self-fund a municipal radio system. Therefore, within LA County, ICIS has a limited though important application; and ICIS is committed to working with LA-RICS in the development of a final regional solution.

*ICIS governance structure.* Each city joining ICIS as full members has a seat on the ICIS Governing Board, which meets at least monthly and follows the requirements of the Brown Act. Several standing committees provide the Board guidance: operating, technical and legislative. Committee memberships draw from the staffs of the member cities. A compensated Executive Director represents ICIS to various outside agencies, as well as coordinates the efforts of the committee staffs.

*ICIS Funding.* ICIS has secured about $6,550,000 in grant funding. Part of this success comes from the ICIS cities' ability to successfully leverage their own local, radio replacement dollars (about $60 million) into a regional, interoperable system.

- *2008 COPS Technology $561,000 congressional appropriation.* ICIS upgraded its Master Site to P-25.

- *2008 COPS Technology Senate appropriation in the amount of $88,854.* ICIS integrated its trunked radio system to the P-25 Master Site.

- *2009 SHSGP Grant in the amount of $2,200,000.* To be used for microwave looping and one or more repeater sites within the San Gabriel Valley.

- *2010 SHSGP grant in the amount of $1,000,000.* For additional microwave looping as well as a backup generator for the Master Site as well as one for the Whittier Site.

- *2010 Department of Justice BJA Grant $500,000 congressional appropriation.* For a microwave link to the Pasadena microwave site as well as for ICIS system narrow banding.

- *2011 UASI Grant in the amount of $2,200,000.*

Each ICIS member city contributes $40,000 per year to support ICIS operations and maintenance budget.

*ICIS Progress to date.* Besides Burbank and Glendale, ICIS today includes the cities of Culver City, Beverly Hills, Montebello, Pasadena, and Pomona: seven cities in all. The Verdugo Dispatch Center recently joined ICIS, bringing radio interoperability to fire operations not only among Burbank, Glendale, and Pasadena, but also Alhambra, Arcadia, Monrovia, Monterey Park, San Gabriel, San

Marino, Sierra Madre, and South Pasadena. Through a Council approved radio maintenance arrangement with Burbank, the Bob Hope Airport also enjoys radio interoperability.

Today, through its subscriber relationships, the ICIS system serves more than 20 agencies and over one million citizens in the LA area. Outdoor coverage is good throughout much of Los Angeles County, particularly those areas most frequented by its members. This July, ICIS will have achieved narrowbanding (from 25 kHz to 12.5 kHz). ICIS members are actively making their individual systems fully compliant with P-25; the ICIS backbone has already achieved P-25 compliance.

## CONCLUDING REMARKS

At this point, we hope you'll agree that the interoperability and broadband efforts within LA County represent substantial progress in the establishment of a regional solution for major metropolitan areas. The interaction between a countywide system in-the-making (LA-RICS) and a limited-but-operational regional system (ICIS) will result in robust solutions that can translate to other areas of the country.

This process can be helped along at the federal level through several initiatives:

- Adopt federally the "systems-of-systems" approach embraced by the State of California. It would require the widespread use of multimode (analog, digital, conventional, trunked) and multiband (VHF, UHF, 700 MHz, 800MHz) radios.

- Through various mechanisms, the federal government could offer grants specifically for the purpose of achieving system interconnection.

- *Agencies must allow others to come onto their dispatch channels.* SAFECOM could review its training standards with the goal of setting this as an expectation. Much work at the local levels will still be needed to change long-standing cultural attitudes.

- Auctioning the public safety spectrum below 512 MHz, as proposed in H.R. 607, would be highly problematic for LA County. The UHF channels for voice interoperability are all under 512 MHz.

- Set cyber security standards that help determine if existing encryption schemes are adequate.

- The federal level is best equipped to allocate enough spectrum for both Smart Grid applications and public safety communications. A guiding principle should be to protect current spectrum for Public safety until alternative technologies are fully vetted.

Thanks you for the opportunity to address this committee.