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2015 년 한-중남미 지식공유포럼을 위한 IDB 지속가능한  
도시 사업사례분석 / 글로벌 개발협력 역량강화  
(국제사례연구를 통한 도시통합관계센터(IOCC)의 경제적  
편익 분석 I) 출장 결과 보고서

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2015. 10

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## I. 해외출장 개요

### 1. 출장개요

□ **과제명:** 2015년 한-중남미 지식공유포럼을 위한 IDB 지속가능한 도시 사업사례분석 / 글로벌 개발협력 역량강화 (국제사례연구를 통한 도시통합관제센터(IOCC)의 경제적 편익 분석 I)

□ **일시:** 2015년 9월 27일(일) - 10월 5일(월)

□ **출장지:** 미국 (워싱턴, 올랜도), 브라질 (리우데자네이루)

#### □ 과제목적 및 내용

##### - 과제 1) 2015년 한-중남미 지식공유포럼을 위한 IDB 지속가능한 도시 사업사례분석

2015년 3월 부산에서 미주개발은행(IDB) 연차총회가 개최됨. 이 연차총회는 아시아에서는 두 번째로 개최되어 그 의의가 깊음. 미주개발은행과 한국정부는 한국과 중남미 국가들 사이에 개발경험을 분석·공유하기로 협의하여 연차총회의 일부로 한-중남미 지식공유포럼을 개최하기로 결정함. 따라서 '경제개발정책', '무역·투자', '지속가능한 에너지 개발', 'ICT 혁신과 생산성', '노동시장', '지속가능한 도시'라는 6개 주제 하에 국내연구기관과 중남미연구기관이 협동연구를 진행하기로 협의함. 6번째 주제인 '지속가능한 도시'는 국토연구원과 미주개발은행 Emerging and Sustainable Cities Initiative (ESCI) 연구진이 각자 한국과 중남미의 도시개발경험에 대하여 연구하기로 협의함.

본 연구는 지속가능한 도시개발을 위해 한국이 (i) 환경과 기후변화, (ii) 도시의 지속가능성, (iii) 재정적 지속가능성과 도시 거버넌스에 대하여 시행한 정책경험을 분석하여 중남미 도시들에게 시사점을 공유하는 데 그 목적이 있음. 아울러 한-중남미간의 도시사업 분야의 교류를 증진시키는 데 그 의의가 있음.

##### - 과제 2) 글로벌 개발협력 역량강화 (GDPC 내부과제: 국제사례연구를 통한 도시통합관제센터(IOCC)의 경제적 편익 분석 I)

빠른 도시화가 진행되고 있는 중남미 도시들은 교통, 방범, 방재, 에너지, 수자원 등의 분야에서 여러 도시문제들을 겪고 있음. 이러한 도시문제를 효율적으로 관리하기 위하여 세계의 여러 도시들은 ICT를 적용한 스마트시티 구축을 시도하고 있으며 도시관리작업을 통합하고 해당 담당자들이 하나의 센터에서 협업할 수 있는 도시통합관제센터(IOCC)와 같은 플랫폼을 구축·운영하고 있음. IOCC는 도시 내에 설치된 검지기 및 현장장비에서 실시간정보를 수신·분석하여 효율적이고 협력적인 의사결정 및 정책수립을 가능하게 함. 이러한 통합관제센터의 국내 사례로는 안양과 송도가 있고, 국제 사례로는 센터기능은 각각 다르지만 마드리드, 시카고, 싱가포르 등의 도시가 있고 중남미에서는 리우데자네이루가 첫 사례임. 상기 도시들의 IOCC가 도시

관리의 효율성을 높이고 있다는 보도 및 자료들이 다수 존재하나 센터의 기능별 자세한 분석과 통합성으로 인해 얻어지는 시너지 효과에 대한 경제적 편익 분석이 부재함. 따라서 본 연구의 목적은 IOCC와 유사한 센터를 운영 중인 아시아, 유럽, 북미, 중남미 도시들의 사례연구를 통하여 IOCC의 경제적 편익을 분석하는 데 필요한 기초자료를 수집·분석하여 경제성 분석의 기본 틀을 개발하는 데 있음.

본 연구는 국제사례연구를 통해 도시통합관제센터(IOCC)의 경제적 편익을 분석하고자 함. 사례연구의 주요 내용으로는 통합관제센터의 장비 및 기능, 현장장비 목록 및 기능, 제공하는 서비스, 정보 수집 및 처리 구조, 정보 활용 및 보급 방법, 센터 관리 및 평가 시스템, 비용 구조(초기 투자비, 관리비, 운용비 등), 센터 구축 후 성과 등에 대한 분석이 포함됨. 먼저 시정부 및 센터가 보유하고 있는 자료를 수집하고 부족한 정보는 센터 담당자들 및 관련 이해관계자들과의 인터뷰 및 시민 설문을 통해 수집하고자 함. 본 연구는 미주개발은행과 공동으로 진행하는 연구로서, 국토연은 안양, 송도, 시카고, 싱가포르 4개 도시의 사례연구를 진행하고 미주개발은행은 마드리드 및 리오데자네이루를 포함한 중남미 도시들의 사례연구를 진행함. 본 연구의 초점은 국제사례연구이며, 연구범위는 국제사례연구를 통하여 통합관제센터의 센터 기능별 분석 및 통합성에서 얻어지는 시너지 효과에 대한 분석을 수행하는 것임.

□ 출장목적

- 과제 1) 2015년 한-중남미 지식공유포럼을 위한 IDB 지속가능한 도시 사업사례분석

과업지시서의 요구사항 중 하나인 전파세미나 수행의 일환으로서 2015년 IDB 부산연차총회의 지식공유포럼에서 발표한 연구결과를 워싱턴본부에서 열리는 LAC Mayors Forum 2015에서 중남미 시장들에게 소개 및 토론

- 과제 2) 글로벌 개발협력 역량강화 (GDPC 내부과제: 국제사례연구를 통한 도시통합관제센터(IOCC)의 경제적 편익 분석 I)

미주개발은행 워싱턴본부에서 공동연구 담당자와 업무협의회, 본 과제 사례도시인 리우데자네이루 및 올랜도 관제센터 담당자와 업무협의회, 리우데자네이루 UrbanTec 2015 컨퍼런스에서 중남미 스마트시티 사업사례소개

□ 출장자 명단

소속	직급	성명
국토연구원	본부장/선임연구위원	이상건
국토인프라본부	연구원	권희서

2. 세부일정

월 일 (요일)	출발지	도착지	방문기관	업무수행내용	접촉예정인물	비 고
9.27(일)	인천 워싱턴	워싱턴 올랜도		- (17:15) 인천 출발 - (22:44) 올랜도 도착	-	
9.28(월)			올랜도관제 센터(OOC), 올랜도시청, 오렌지카운 티관제센터	- (13:30-17:30) 올랜도관제센터, 시청 및 오렌지카운티관제센터 시찰 및 담당자 업무협의회	- Manuel Soto (Orlando Operations Center)	
9.29(화)	올랜도	워싱턴	우드로윌슨 센터	- (11:50) 올랜도 출발 - (13:57) 워싱턴레이건 도착 - (16:00-18:00) 우드로윌슨센터 공동연구 담당자 업무협의회 - (18:00-20:00) 세계은행 타밀나두 스마트시티과제 담당자 업무협의회	- Manuel Soto (Orlando Operations Center) - Ellis Juan (IDB) - Mauricio Bouskela (IDB) - Matteo Grazzi (IDB) - Marcia Casseb (IDB) - Dr. HyoungGeun Wang (World Bank) - Kyungchul Nam (World Bank)	
9.30(수)	워싱턴		미주개발은 행	- (09:00-15:00) 미주개발은행 LAC Mayors Forum 2015 참석 및 연사발표 - (15:00-17:00) 미주개발은행 공동연구 담당자 업무협의회 - (19:21) 워싱턴레이건 출발	- Ellis Juan (IDB) - Mauricio Bouskela (IDB) - Matteo Grazzi (IDB) - Marcia Casseb (IDB) - Blair Ruble (WWC) - Allison Garland (WWC)	
10.1(목)		리우데자 네이루		- (14:30) 리우데자네이루 도착	-	
10.2(금)			FGV Congress Center	- (09:00-16:00) UrbanTec Brasil 2015 Smart Solutions for Better Cities 참석, 연사발표 및 리우관제센터 담당자와 업무협의회	- Mauricio Bouskela (IDB) - Alexander Cardeman (COR) - Clara Schreiner (COR)	
10.3(토)	리우데자 네이루			- (08:07) 리우데자네이루 출발	-	
10.4(일)				-	-	
10.5(월)		인천		- (05:55) 인천 도착	-	

## II. 올랜도(미국) 주요 수행내용

### 1. 올랜도시청 교통과 시찰 및 담당자 업무협의회

□ 개요

- 일시: 2015년 9월 28일(월) 13:30~14:30
- 장소: 올랜도시청
- 주요참석자:
  - 국토연구원: 이상건 본부장, 권희서 연구원
  - 올랜도 시청: Wendy Horency (Assistant Division Manager), Kory Keith (Orlando Stops Operations Manager)



<올랜도 시청 시찰 및 회의 사진>

○ 주요 회의 내용

**Orlando City Hall Smart City related City Operation Site Visit and Q&A**

- Q: Speed enforcement in Orlando?
- A: Orlando has total 500 speed cameras but does not enforce speed violation. Orlando only enforces red light violation since 2008. Red light violation enforcement became the state law in 2010, revision in 2013. The red light violation enforcement takes place at intersections within the city of Orlando.
- Q: What about the fine?
- A: There is an initial fine of \$158, if not paid within 60 days it goes up to \$262. Out of the \$158, City of Orlando gets \$75, \$83 goes to the state, \$10 goes to the brain and spine research trust, and \$3 goes to the local trauma center.
- Q: How do you fine the visitors?
- A: Concerning the visitors' violation, some states allow Orlando city to exchange the violation information and put hold on the license. For visitors from different countries, it can be difficult through civil force, but the issue often gets raised at the custom when the violator makes another visit to the U.S.
- Q: How much decrease of accident did you experience since the enforcement?
- A: 65% reduction in angle accidents (perpendicular) within the intersection.



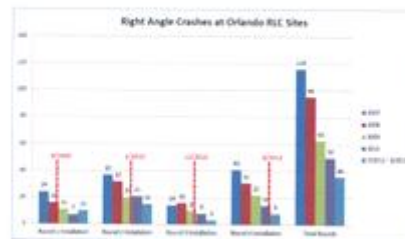
### Orlando STOPS Program Highlights (cont'd)

- 53% of all violations issued, went to owners of vehicles registered in Orlando
- During the past fiscal year, police have requested videos at least 50 times as a tool for investigating collisions, crimes and various other events under police investigation
- 40-60K given to support Best Foot Forward public safety initiative

### Orlando STOPS Program Highlights

- 65% reduction in right angle crashes associated with red light running (2009-2013)
- 91% of vehicles issued a red light running violation did not receive a second violation
- The monthly average red light running violations per camera per month have decreased by 28% (FY13-14)
- The ratio of drivers being issued Notice of Violations (NOV) have decreased in Orlando by approximately 20%
  - In 2012, 1 in every 1,995 vehicles going through red light camera intersections were issued a NOV
  - In 2013, 1 in every 2,403 vehicles were issued a NOV

### Right Angle Crashes



#### <Red light violation program highlights>

- Q: The software you use for viewing the DVR video saved in the camera when two sensors detects speed violation of the vehicle, is it a national software?
- A: Yes, Orlando uses the national software produced by Zona which is called ATS (America Traffic Solution). The camera reads the license plate number and the software generates the driver's information. Also, the light has to be red for the speed violation camera to turn on, the system is set that way which reduces the conflict when drivers claim that it is video reading error.
- Q: Do you have the sensors and cameras installed at certain spots or do you have them installed in all intersections?
- A: We work closely with the transportation engineering to select the sites with the most angle accidents. Also, in many other cities often city government officers just do the approving and the rest is handled by vendors. In Orlando, we have our own staff handling the back office of such violation enforcement. We believe that having these functions within the city helps to build trust amongst the public.
- Q: What is the reason for not sending the tickets automatically for red light violation? To double-check whether the violation actually did take place?
- A: Yes, because for violation ticketing many people put on claim, arguing that they did not made the violation and it was misinterpretation of video. This is related to trust issue as well so we have our city hall staff make verification and approval for the tickets to be issued as clear image evidences are required to prove the violation. For unpaid tolls on toll roads, the ticket gets sent automatically to drivers.
- If it is a toll road and you do not pay the toll then you get a ticket in the mail.

## 2. 올랜도통합관제센터 시찰 및 담당자 업무협의회

### □ 개요

○ 일시: 2015년 9월 28일(월) 14:50~16:30

○ 장소: 올랜도관제센터

○ 주요참석자:

- 국토연구원: 이상건 본부장, 권희서 연구원

- 올랜도관제센터: Manuel Soto (Head of Orlando Operations Center), Benton Bonney (Transportation Systems Manager)



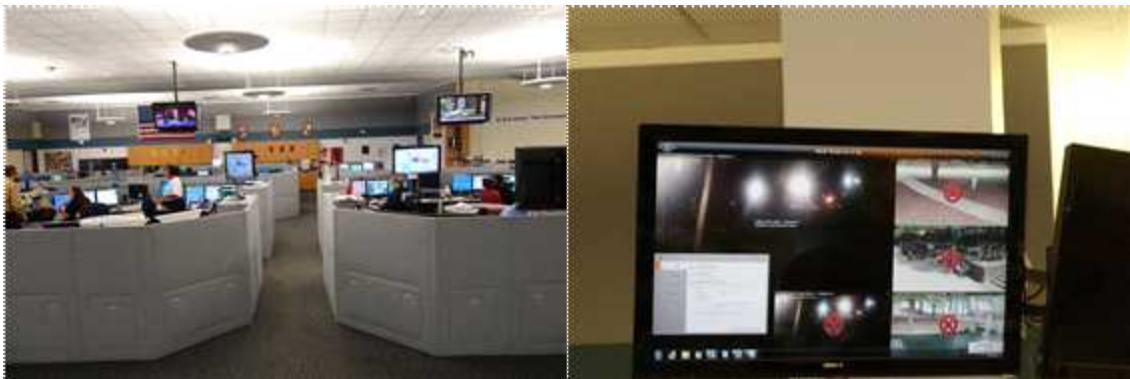
<올랜도관제센터 교통부서 시찰 및 회의 사진>

○ 주요 회의 내용

**Orlando Traffic Management Center within the Orlando Operations Center**

- 2x5 wall with 55 inch monitors that display City or Orlando's CCTV cameras and enable the operators here to pan, tilt, zoom on the cameras. We receive local news feed especially weather to react quickly to weather patterns which is important in the tropical climate of Orlando. Also, local news often catches incident news on roads before the Center, so the Center keeps close eye on it to make prompt reaction to such incidents.
- Orlando Traffic Management Center does not perform the enforcement: City Hall performs that function. We have the 911 emergency police and fire department in the room next door so we cooperate together for dealing with road incidents and accidents. We enable the viewing of each others' cameras: traffic cameras are installed high up that provides a wide view of the traffic flow while police camera network is installed closer to the streets and roads and can detect faces.
- Orlando Traffic Management Center manages the traffic signals within the city, not the county. County manages their traffic signals. In terms of roads, interstate highways are run by Department of Transportation, turnpikes by turnpike corporation, expressways by expressway corporations. For state highways, Orlando Traffic Management Center maintains the traffic signals and sets the times in. We control about 80% of the traffic signals that exist within the City of Orlando.
- The Center uses the software produced by 'TrafficWay', run in TOD plans. Much of the day the signals are run in coordinated pattern, sometimes at night they are run free. The Center adjusts signal timing to clear tracks for the SunRail that passes through Orlando. Orlando hosts a lot of large-scale events in downtown at the major basketball arena Amway Center that seats 15,000 and foot ball stadium, major league soccer stadium etc., and in case of such large events we run different signal patterns. The Orlando Convention Center is the second largest in the U.S. and attracts huge traffic as well.
- We use radio-based system that vehicles send out location information to the center. For emergency vehicles we preempt the signals to facilitate their movement. We also run transit signal priority especially for buses. We have a system called Lymo, a bus network that runs on exclusive lanes. Department of Transportation is developing bus feeder routes to encourage access to the SunRail to and from the stations. Orlando Traffic Management Center has secure the fiber optic network in the past few years, and now it is being used to communicate bus arrival information etc. by Automatic Vehicle Location (AVL) through little kiosks at bus stops and smartphone applications. Such information provision on public transportation gets handled by the Central Florida Transit Authority (LYNX).
- Signal timing plans in Orlando City are mostly TOD based. In Orange County they use the Siemens system 'Scoots' and 'Eagle'.
- Generally for downtowns with a lot of pedestrian crossings, the signals essentially work as fixed-time as we want to provide enough time for the pedestrians.
- Federal Highway Transport Administration has done some studies on the benefits of ITS application.

- Mr. Charlie Whistle at Seminole County has also done some benefit analysis on Adaptive Traffic Signal Control system etc.



<올랜드관제센터 방법 및 방재 부서 시찰 및 회의 사진>

○ 주요 회의 내용

- We have the Orlando Police Department (OPD) and Orlando Fire Department (OFD) in the same room.
- We have security cameras called IRIS for crime prevention purpose managed by OPD. The images of these IRIS cameras are recorded 24/7 and maintained for 45 days. The traffic cameras do not record images.
- We have access to these security cameras at the Emergency Operation Center of the OOC, especially for large events such as a VIP's visit, staffs at the Emergency Operation Center also monitors the security cameras to synchronize action at the outbreak of incident.
- The monitors have Automatic Vehicle Locator (AVL) function that enables the staffs to track the movement of operatus from fire department such as the fire trucks, emergency medical vehicles etc.
- We also plan to put up possibly 2x5 or larger monitor panels on two walls next year upon securing of budget. We used to operate with projectors on wall for large screen, but operating projectors for a long time every day caused heating and many technological failures, so we are looking into installing display monitors.
- The staffs here are dispatched staffs from OPD and OFD, the cameras are

managed at the headquarters. The feed is shared at the center here for the dispatched staff.

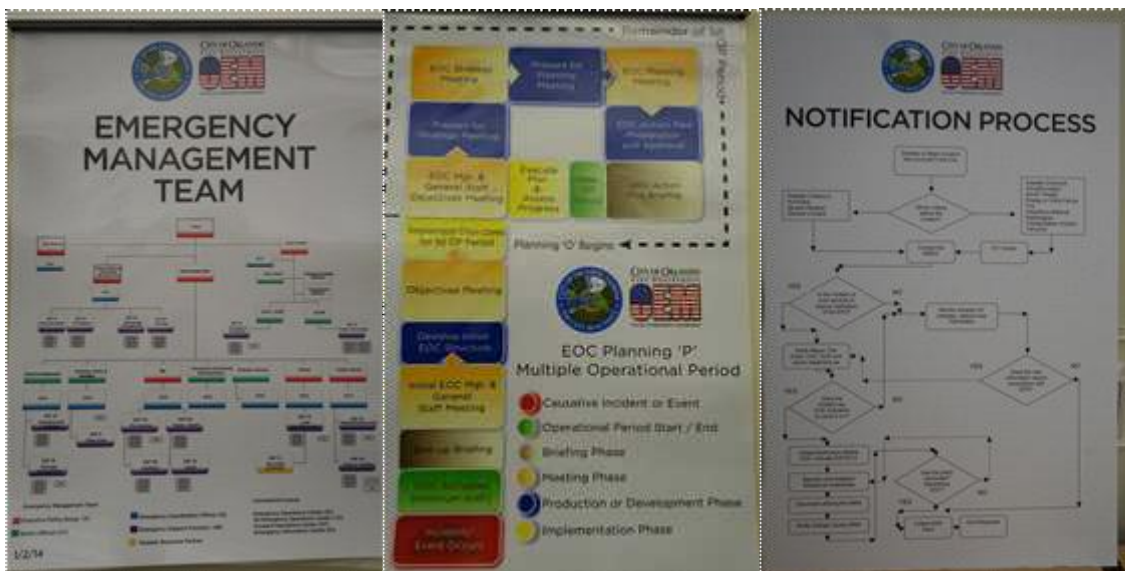
- Pamela: OFD units here have motored data terminal that shows OFD dispatched vehicles' movement in real time. When we get an emergency help call, we would dispatch the vehicle unit (fire trucks, ambulances, rescue trucks, tower trucks...) closest to the incident location. Once they go from red to yellow on the screen, we know that the vehicle is responding. From yellow to green we know that they have arrived at the scene of incident. The information of the caller gets displayed on the screen installed at vehicle units automatically.
- City of Orlando's waste management division have a camera system with GPS tracking system that allows them to track garbage trucks around the city and the camera starts recording automatically for few seconds at the stoppage of garbage trucks to later see the amount of garbages, illegal dumping etc.
- Not at the OOC, but at the OFD headquarters they keep the response time data at the records department. This is for the accreditation of the fire department based on our response to the EMD protocol.
- April Tayler at OFD will be able to provide you informationi about the response time data and how technology affected the decrease of response time.
- Having the EMD protocol web-based changes a lot. As opposed to answering the call while flipping through the paper instruction book, we can type in the information, click and the software moves you to the next appropriate question to ask to the caller. Also this enables automatic sending of the caller information to the emergency vehicles.
- Our CAD and EMD softwares are the ones used by most of the centers that are accredited in Florida (including Orange County) and U.S. According to a recent conference I went, centers in England and Switzerland are using the same protocol as us.
- E.g. A call is regarding an emergency of someone being unconscious. The next question that leads to is 'is the person breathing?' Then you ask the patient's gender, age etc.
- The EMD software also generates a code based on the caller/patient information put in, which automatically selects the appropriate vehicle to dispatch.
- Q: How do you work together with the police, transport and emergency department in OOC?
- A: As you can see we have the police department right next, but we still call each other on phone because we want the calls to be recorded. It's a lot easier to work together being in the same physical place especially for seeking cooperation at emergency situation. For example, if we receive a call that involves violence then we ask for the police's cooperation, if they receive a call that requires fire or medical attention for example shooting call, then they ask us to come with them.
- We also work together with the transport department a lot with vehicle dispatch,

and also when the incident involves severe weathers and natural disasters such as flooding and falling of trees, abruption of power line etc. then we use the traffic cameras to see the situation. We also often let the transport department know what traffic lights are out because we get calls regarding such incidents. When trees come down from storm especially those that get entangled with power line, transport department dispatch people out for fixing road or traffic light damage, we dispatch staff to make sure there is no injury and tape off the area, and OPD will block the street. For certain calls like this all three departments work together. We have a direct line to the power company at OOC as well because in such case they would need to get involved as well.

- OFD at OOC and the Orange County Center support each other, especially for incidents that happen near the jurisdictional boundary. For all of the boundary areas, we know which units of theirs are close by on the map and they can respond with us. We have joint responsibility with other cities and municipalities around us within the Orange County that we work in collaboration with such as the Winter Park municipality above us.
- Q: Amongst the OOC functions (fire, police, traffic, emergency management), which ones require the collaboration most with the Orange County operation center?
- A: Especially for incidents that occur near the boundary, for example tree falling down and disrupting the power lines. For some roads, the jurisdiction continuously changes between city, county, and state and require collaborative approach. When Hurricane Charlie hit in 2004, the citizens who lived nearby the roads with complex jurisdictional boundaries called us to complain that we stopped at a side of a street and did not clear the hurricane damage on the other side. City or Orlando is not well rounded up, we have pockets that does not belong to us.
- The GIS map of City of Orlando will be provided by Manuel Soto.
- Generally, bringing in the newest technology often takes a few budget cycle due to budget constraint.
- Pamela at the OFD gets all sorts of calls (911) including criminal incidents, health-related emergencies, road incidents, tree-falling down etc. We have a centralized emergency call receiving system at the OOC. Depending on the type of incident we route the call. If you are in the City of Orlando and press 911, the call would come to the OOC. It is based on the cellular towers. If you are in Tampa and dial 911, it is affiliated to the cellular tower in Tampa so it will go to their 911 center.
- Soto: In the past few years, we had many visitors to our OOC: the Mayor and other representatives visit from Rio de Janeiro, also from Brasilia, State of Santa Catarina, some from national government level from the ministries of emergency management and public safety. In October we will be getting visit from Central and South America ...
- Lee: Based on my previous experience, I think the major concerns of LAC countries

are crime prevention.

- Soto: OOC is adaptable in a way that for events that are security-driven we can focus our EOC support for security operation. EOC is able to adjust our support whether it is for natural disaster, large security operation or special event etc. (major soccer game, basketball game...)
- Soto: OOC's approach can be understood as each departments operating their while cooperating with one another but in major cases where multi-department approach is required the EOC takes the lead, having other departments under EOC.





<올랜도관제센터 비상관리 부서 시찰 및 회의 사진>

○ 주요 회의 내용

- In terms of information control, sharing etc. basic rule is that if the asset is owned by the city, the city controls it; if owned by the police, the police controls it. For traffic, data sharing is much easier but for security and crime prevention it is more difficult. For example, if we have riot in the city, I can view the police cameras at the OOC but I don't have the authority to control (pan, tilt, zoom) the cameras.
- The request to view different cameras has a very simple procedure internally within the city within the key players (city hall, OPD and OFD headquarter etc.)
- 48 hour plan for hurricane emergency situation.
- Emergency operation center can view the traffic cameras through any monitor. The monitors can also bring in IRIS cameras (crime CCTVs) to share operational images yet the control of those images lies with the OPD. When in an emergency situation representatives from various departments gather up at the EOC to enable quick response to needs such as camera pan, tilt, zoom etc.
- Guidebook of traffic management center for emergency operation received.
- Coordination becomes more difficult when a city has a decentralized structure where traffic management takes place on one side of the town, and when emergency operation takes place on another side of the town.
- Under emergency situation, the Mayor speaks directly to the public in the media room within the OOC.
- Soto: I will share some of our internal documents with you in a dropbox folder.

### 3. 오렌지카운티관제센터 시찰 및 담당자 업무협의회

□ 개요

○ 일시: 2015년 9월 28일(월) 16:30~17:30

○ 장소: 오렌지카운티관제센터

○ 주요참석자:

- 국토연구원: 이상건 본부장, 권희서 연구원

- 오렌지카운티관제센터: Dave Freeman (Head of Orange County Emergency Management Center)



<오렌지카운티관제센터 시찰 및 회의 사진>

○ 주요 회의 내용

- Dave: Type of disasters handles by Orange County OEM: residential fires, wildfires, floods, hurricanes, sinkholes, terrorism, tornadoes, thunderstorms, chemical spills, pandemic flu etc.

- Orange county emergency response team is composed of county departments, divisions, public and private organizations, public schools and other stakeholders.



- Orange County EOC is a 4,000 sf facility with 120 person capacity; with 47 computers/laptop connections (total 80 stations), video/telephone conferencing facility, media room, conference rooms etc.
- OCEOC has a secondary alternate center in the Orlando Convention Center and can operate two centers at once if needed.
- The organizational structure is the following where Mayor is the Director of EM.
- The video/teleconferencing units are most often used to talk with the City of Orlando EOC and Univ. of Central Florida EOC.
- We contract out some services to private companies and form PPP.
- Having to update the EMAP accreditation helps the center to keep its plan up to date.
- Electronic records: Visit Orlando (hotel availability for evacuees. 144,000 hotel rooms are in Orlando City), E-Team (incident management software), E-Plan (national registry of hazardous materials)

## OCERT

### Emergency Support Functions

<ul style="list-style-type: none"> <li>• ESF #1 - Transportation</li> <li>• ESF #2 - Communications</li> <li>• ESF #3 - Public Works</li> <li>• ESF #4/9/10 - Fire/SAR/HazMat</li> <li>• ESF #5 - Information/Planning</li> <li>• ESF #6 - Mass Care</li> <li>• ESF #7 - Resource Support</li> <li>• ESF #8 - Health and Medical</li> <li>• ESF #11 - Food &amp; Water</li> <li>• ESF #12 - Energy</li> </ul>	<ul style="list-style-type: none"> <li>• ESF #13 - Military Support</li> <li>• ESF #14 - Public Information</li> <li>• ESF #15 - Volunteers and Donations Management</li> <li>• ESF #16 - Law Enforcement</li> <li>• ESF #17 - Animal Care</li> <li>• ESF #18 - Community and Business</li> <li>• ESF #19 - Damage Assessment</li> <li>• ESF #20 - Utilities</li> </ul>
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- Orange County Emergency Response Team is composed of 20 Emergency Support Functions (ESF) and 33 Emergency Coordination Officers (ECO). Only the affected ESFs get activated.
- OCAlert.net provides severe weather alerts, amber alerts, civil emergency messages, severe traffic disruptions, evacuation notices, shelter-in-place warnings, environmental alerts etc. via web and mobile application to nearly 14,000 registered

subscribers.

- Orange County OEM stays connected with SNS via twitter and facebook.



- Orange County OEM stays connected with SNS via twitter and facebook.
- We harness IT especially for information distribution to citizens. We also have GIS multiple layers (InfoMAP) we have it available in public version and internal version. (same in OOC) This GIS Map indicates in real time the flooding sites etc. We incorporate video recordings in the map as well. The GIS Map of City of Orlando is incorporated within the Orange County GIS map. OOC can see the Orange County GIS map and visa versa.
- GIS Infomap contains flood planes, lakes, drainages...
- In the perspective of ROI for having a dedicated operation facility like OOC or OCEOC, we believe our main effort is to minimize the economic impact of a disruption such as airport closing or road evacuation etc. especially considering that Orlando has a large tourism industry and business convention industry. Public perception of that impact is also very important, having the response capability towards emergency situations. Multi-department, multi-jurisdictional response is greatly important. We have the system and processes already established that will help us manage the situation anytime if a storm hits, coordinate and response much quicker. People's perception of safety, sleeping well at night that the city or county has a good security and disaster response system is something intangible. Citizens see the police officers patrolling on streets, police cars, fire trucks, ambulances etc. but they do not see the apparatus or system of the management of those urban services. If we are to calculate the cost, we would have to add up the cost of center installation, maintenance, staff costs, equipment costs etc. We have multiple funding stream as well, we get federal grants and state grants... a little over a third of the budget is funded by the county. What all of this is worth is very difficult to quantify.
- FEMA the federal government had made attempt to set variables and do a scenario study, what the impact is/would be with and without the center.
- The thing about previous data is that we didn't have computers readily available before 1990s, and getting the number of casualty, response time, damage scale, expenditures etc. recorded in detail was difficult. From 2004 storm, it is possible.
- I think with the center and smart system, the recovery would have been enhanced, reimbursement as well.
- We can try get data from Panhandle, Jacksonville, last two years ago, impact from flooding... that you can compare with the impact from flooding in Orlando with the smart system installed.

### III. 워싱턴(미국) 주요 수행내용

#### 1. 우드로윌슨센터 공동연구 담당자 업무협의회

□ 개요

- 일시: 2015년 9월 29일(화) 16:00~17:00
- 장소: 우드로윌슨센터
- 주요참석자:
  - 국토연구원: 이상건 본부장, 권희서 연구원
  - 우드로윌슨센터: Blair Ruble (Vice President for Programs), Allison Garland (Program Associate)



<회의 사진>

○ 주요 회의 내용

- Lee: General description of the project.
- Lee: What we imagine to expect from WWC are the current situation of LAC countries, literature review, critical issues, opportunities for international cooperation, ideas on feasible procedure and funding plans for LAC...
- Lee: Some Korean systems have been implemented in LAC such as bus card system in Bogota connected with BRT, Colombia and progressive signal control system in Asuncion, Paraguay. We will provide case studies on these.
- Ruble: As the local LAC expert for this project, we have been reaching Juan Carlos Munios, Deputy Director of the transport engineering and logistics at the Catholic University of Chile. He worked as the former advisor for the Chile Ministry of Transportation. His research center is also looking at partnership with Cisco in the area of smart technology for LAC.
- Garland: Dr. Munios can contribute to the written work for this project. He is interested in knowing more detail, whether you have specifics about the city to be studied, size of the city or whether you have some countries you are particularly

interested in the LAC ...

- Lee: I agree, my concern also is that covering the whole of LAC would be too broad. Cities need to install ITS based on their own individual circumstances, we need a customized way to provide strategies for cities in different categories. I think we can either focus on one city category by size, perhaps medium-sized cities or large-sized cities. Otherwise we can also approach all spectrum of cities in a more basic manner.
- Ruble: Small and medium sized cities of 200,000 ~ 1 million population, I believe that would be an interesting category of cities to look at in part because that is the category where most rapid growth is taking place. This could be one way of narrowing down our research area. Cities that have some kind of developed urban system already. If this is the direction you would like, we feel very comfortable about it.
- Garland: In this, we can deal with the 'emerging' cities.
- Ruble: This raises a different kind of financial issue, too as they tend to be more under control of some kind of higher political authority with fewer resources.
- Lee: You're right, large-sized cities have already done various ITS application already as they have more budget as a city. Mega-cities like Sao Paulo and Rio de Janeiro already has developed smart transportation networks. I suggest too the cities below mega-cities (i.e. medium and large cities) because although they wish to implement smart transportation technology, they often do not know the way. If we can provide help and guidance for these cities, this project would be very meaningful.
- Ruble: Countries like Brazil and Colombia would have a number of cities that fit into this category: medium-sized cities with existing developed urban system that enables the technology application of smart transportation.
- Lee: On KRIHS's side, the major participants for this project will be myself, Rain and another colleague Ms. HeeAh Cho with consultation with other Korean smart city and smart transportation experts within and outside KRIHS.
- Garland: On our side, it will be myself, Dr. Ruble and as for expert consultation we will start with Dr. Juan Carlos Munios, he is very interested.
- Lee: As for the final output, there can be a joint workshop in Korea or D.C. As I mentioned before, KRIHS has some funding for inviting one or two experts into such joint workshop, which can be held either in Korea or D.C. Which location would be the best to achieve the objective of this project? For example if the objective concerns advertising of the research output and stimulating further interest, D.C. would be a good location to get together with the IDB and the World Bank for example, and easier for LAC experts to participate.
- Ruble: You're right, but MOLIT of Korea being the client, wouldn't they be

interested the most in hearing the outcome of this research? Presentation to MOLIT maybe? We better figure out what would be most productive. If the purpose is to expand the knowledge of MOLIT, then it would make more sense to have the joint workshop in Seoul or at MOLIT. If the purpose is to encourage LAC participation and also encourage partnerships with the World Bank and IDB then D.C. would make more sense.

- Lee: Actually, most important thing is funding in order to proceed further with this initiative and possibly link to projects on smart transportation, even if just pilot projects. I do not wish for this research to just finish in paper, I would like to see it connect to next step, small or big. For medium-sized cities that require funding, we can initiate pilot projects with MDBs or with Korean ODA funding. MOLIT of Korea has their own funding for ODA projects too. We can propose some pilot projects to MOLIT, for providing basic designs or F/S for cities of partner countries, based on the analysis made in this project report.
- Ruble: So I understand that your concept of how this project moves forward is that this project produces a report that covers the landscape, defines what the possibilities are, what the challenges are and what the opportunities are. We will then on the basis of this report, think of a pilot project. Presenting the report would be the assessment of what's happening now, plus the proposal for the follow-on projects. And then with the follow-on funding, we will then think strategically about either the importance of involving the IDB, WB or going directly to cities in LAC with the Korean funding.
- Garland: This makes a good sense to work with Dr. Munios considering his good network in the LAC region, especially Chile and Colombia. Chile and Colombia can actually be our two options when looking at selecting partner countries for pilot projects.
- Kwon: Generalizing the overall obstacles and constraints for the whole of LAC would be rather difficult considering that there are so many countries with varying circumstances.
- Garland: Right.
- Ruble: Chile and Colombia both have sufficient resources at the level that they can begin to invest in city systems and smart transportation. They have the cities that fit into the category that we are talking about. The political situations are looking more hopeful and stable compared to Brazil or Argentina at the moment. Given the scale of this project, maybe we could focus on these two countries as a start.
- Garland: Like you mentioned about the 'landscape', we can have a section that talks broadly about the LAC region and look in depth into Chile and Colombia as case studies.
- Lee: Actually Korean government would be willing to do projects with Colombia

considering that Colombia was one country in Latin America that dispatched troops to the Korean War. Korean government would find good reasoning for supporting Colombia as global partnership through ODA. If we can try to find pilot study city especially in Colombia this would be promising.

- Ruble: That's very good to know.
- Garland: One more thing is budget, Wilson Center haven't included travel expenses in our budget. If there is a seminar for the paper to be presented, experts from Latin America, one or two, would be able to get funded for their travel by KRIHS?
- Lee: Yes, KRIHS funding can cover up to two experts. I had a conversation with the director of GDPC about having a joint workshop either in Korea or D.C. possibly in the coming March. Actually, I think MOLIT officers would quite like to travel to D.C. I will consult with MOLIT about the ideal location for the joint workshop for research outcome presentation.
- Lee: We expect this project's contract to be processed within October.
- Kwon: MOLIT officers previously commented that they would like this project to be finished at least by March next year, so you can imagine the project scope.
- Garland: It is very good to know through this meeting, where this project would lead to. So we would invite one or two expert participation from Latin America.
- Lee: Regarding the report length and expected number of pages, we will have a consultation with MOLIT. MOLIT actually asked the report in Korean, but I think it would be beneficial to have them both. I'll have a discussion about this also.
- Garland: For the previous joint research with Dr. Han at KRIHS, we provided written reports to him and I think he used them as resources to write his own one report that included the Korean side as well. I don't think he submitted the reports we produced for him as they were, I think he used them as information.
- Kwon: This time, possibly dividing chapters between KRIHS and WWC might be an option. Say 1) Korean side talking about situation of ITS implementation in Korea, benefits... (KRIHS) , 2) The cases of Korean system being implemented in LAC, obstacles faced... (KRIHS) , 3) Overview of the landscape of LAC focusing on few cities with more details, possibly those of Chile and Colombia (WWC), 4) Identifying key challenges and strategies of overcoming obstacles... (WWC) 5) Suggesting export model of Korean smart transportation system to LAC cities... (KRIHS).
- Ruble: This is very helpful for us to see what we are doing and how we will produce the output together.
- Garland: I think that could be possible, dividing the chapters.
- Lee: What would be your preferred way of regular communication?
- Garland: We can do skype or we can use the video conference system.
- Kwon: I think skype would be especially beneficial for group call, if we wish to join Dr. Munios as well.

- Garland: That's a good idea. On our side, myself and Dr. Munios would be joining mainly and Dr. Ruble time to time.
- Ruble: Gordon might be interested in being involved as well, our global affairs scholar.
- Garland: After you have a discussion with MOLIT, it would be good to know the scope and expectations in terms of report length etc. so that we can let Dr. Munios know what is expected.

## 2. 세계은행 타밀나두 스마트시티 과제 담당자 업무협의회

### □ 개요

- 일시: 2015년 9월 29일(화) 18:00~20:00
- 장소: 우래옥
- 주요참석자:
  - 국토연구원: 이상건 본부장, 권희서 연구원
  - 세계은행: 왕형근 박사, 남경철 과장



<회의 사진>

### ○ 주요 회의 내용

- 왕: 이본부장에게 인도 북부 뉴델리지역에서 World Bank TA Deepak Bhatia가 진행 중인 스마트시티 컨설팅 과제에 대한 PwC India의 보고서 검토 및 코멘트 제공을 부탁
- 현재 수행중인 타밀나두 스마트시티 과제의 향후 추진일정: 10월 안으로 Questionnaire 및 필요한 city data를 Sundar를 통해 모두 수집하여 분석 시작
- 왕: 12월 9-11일에 잠정적으로 인도 첸나이에서 최종워크숍을 진행하기로 인도 주정부와 협의됨
- 왕: 최종워크숍 때 Detailed Project Report (DPR)을 비롯한 bidding document의 초안을 가지고 가는 것이 바람직, Sundar와 긴밀한 협력을 부탁
- 이: 스마트시티 솔루션에 대한 상세지식은 실질적으로 우리나라 중소기업이 가지고 있으니 솔루션 정리에 있어서 중소기업들과 협력하겠음

### 3. 미주개발은행 LAC Mayor's Forum 2015 참석 및 연사발표

□ 개요

○ 일시: 2015년 9월 30일(수) 16:00~17:00

○ 장소: 미주개발은행

○ 주요참석자:

- 국토연구원: 이상건 본부장, 권희서 연구원

- 미주개발은행 워싱턴: Ellis Juan, Carolina Barco, Mauricio Bouskela, Matteo Grazzi, Luis Schloeter

- 미주개발은행 브라질: Marcia Casseb, Marcela Bessa



<행사 사진>

○ 주요 내용

- Introduction and welcoming address by the IDB President Luis Alberto Moreno

- Presentation: Evaluation and Lessons Learned during the 5 years of the Emerging and Sustainable Cities Initiative by Ellis J. Juan, General Coordinator of the ESCI, IDB

- Discussion session: Experience in the Development of Sustainable Cities in Korea and Japan. Moderated by Andres Blanco, Senior Specialist of the IFscal and Municipal Management, IDB.

- Dr Sang Keon Lee's presentation on Korea's Pursuit for "Sustainable Cities" through New Town Development and Implications for LAC

- Toyama Mayor Mr. Masashi Mori's presentation on Toyama City's substantiality projects

## 1. 미주개발은행 공동연구 담당자 업무협의회

### □ 개요

- 일시: 2015년 9월 30일(수) 15:00~17:00
- 장소: 미주개발은행
- 주요참석자:
  - 국토연구원: 이상건 본부장, 권희서 연구원
  - 미주개발은행: Mauricio Bouskela



<회의 사진>

### ○ 주요 회의 내용

- UrbanTec Brasil 2015 Smart Solutions for Better Cities panel discussion points and questions
- Explanation on Dr. Lee's experience in the past 4 years providing consulting to LAC countries such as Goiania (Brazil), Montevideo (Uruguay), Santa Ana (El Salvador) and Montego Bay (Jamaica).
- The most important factors of consideration for the LAC local government officers when implementing such smart city project: strong willingness and driving force of the implementing organization (usually the municipal government), funding securement within the city as well as looking for grant or loan from MDBs such as the IDB, as well as close technical partnership with another country with expertise keeping in mind of training domestic officials and technicians to sustainably maintain and manage the system after implementation.

## IV. 리우데자네이루(브라질) 주요 수행내용

### 1. UrbanTec Brasil 2015 Smart Solutions for Better Cities 참석, 연사발표 및 리우관제센터 담당자와 업무협의회

#### □ 개요

- 일시: 2015년 10월 2일(금) 09:00~17:00
- 장소: FGV Congress Center
- 주요참석자:
  - 국토연구원: 이상건 본부장, 권희서 연구원
  - 미주개발은행: Mauricio Bouskela, Marcelo Bessa
  - 리우관제센터: Alexandre Cardeman, Clara Schneider



<행사 사진>

#### ○ 주요 회의 내용

- Welcoming address by Luiz Fernando Pezao (State Governor of Rio de Janeiro), Dr. Carlos Ivan Simonsen Leal (President of FGV), Gerald Bose (President and CEO of Koelnmesse), Jurgen Roters (Mayor of the City of Cologne) and Harald Klein (Consul General of Germany in Rio de Janeiro)
- Session 6 Transforming mid-sized cities into smart cities: best practices from Brazil
- Ana Hofmann (Regional Director of Microsoft in Rio de Janeiro): Smart city technologies of Microsoft
- Alejandro Moran (Head of Public Sector Americas at Everis): Smart city technologies of Everis
- Nina Lualdi (Senior Director for Transformational Initiatives and Strategic Investments in Brazil at Cisco): Smart city technologies of Cisco
- Sang Keon Lee (Director of National Infrastructure Division at the Korea Research Institute for Human Settlements (KRIHS): Experience of implementing smart city projects in LAC
- Shared case study report writing progress with Alexandre Cardeman and Clara Schneider of the Rio Operations Center.

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