



Rahm Emanuel, Mayor

Chicago Traffic Signal Interconnect Plan Briefing to CMAP RTOC / ATTF

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Deputy Commissioner, CDOT

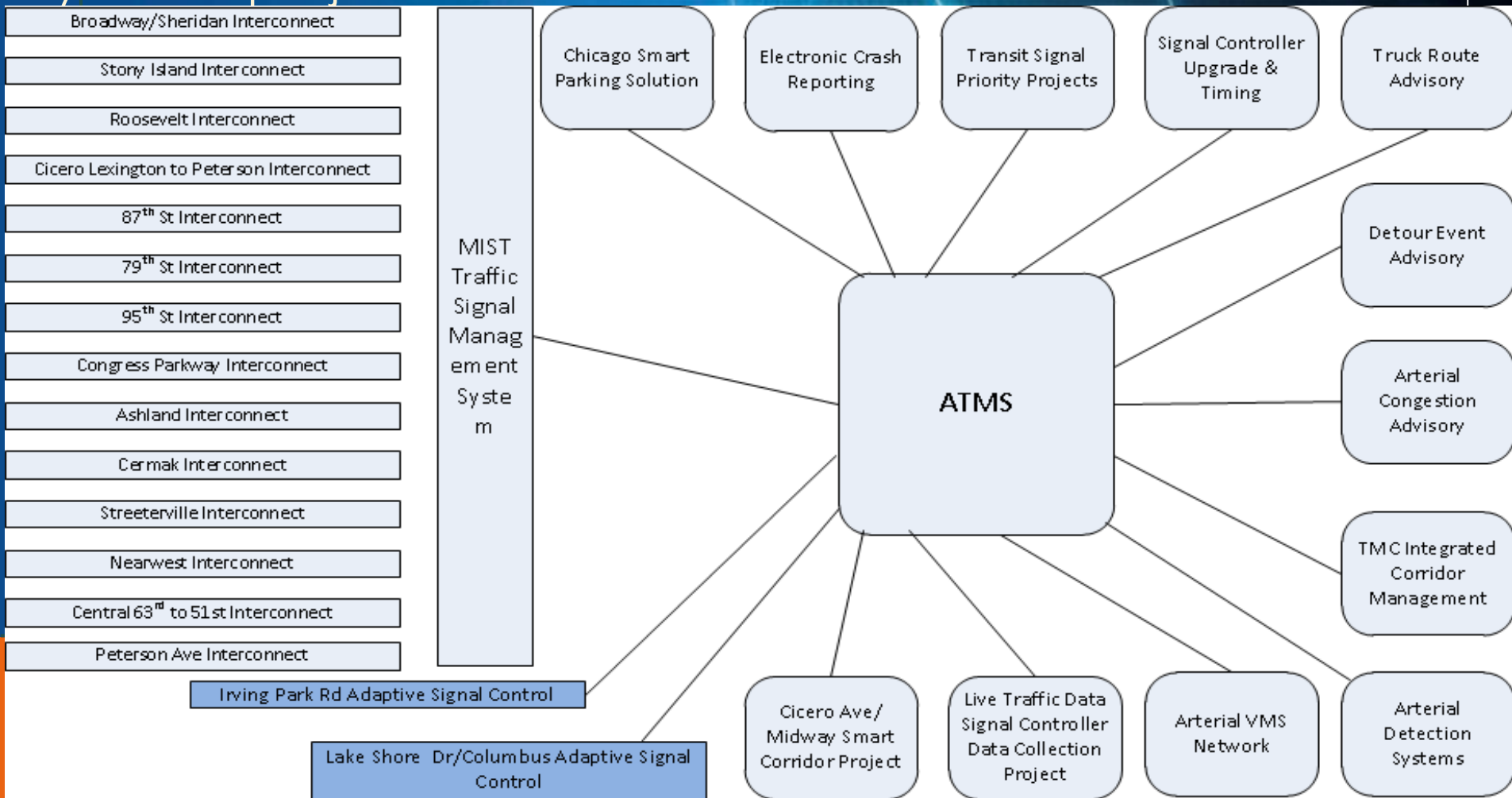


Chicago Traffic Management Center

- Proposed in the 1990s with a core facility and Advanced Traffic Management System (ATMS) to centralize traffic management
- In 2015 CDOT started the implementation of the Advanced Traffic Management System (ATMS)



Chicago TMC is now refers to ~25 Intelligent Transportation Systems projects of which the ATMS is the hub



The ATMS and the other ITS projects together will create an integrated software system and infrastructure (TMC) for centralizing command and control of traffic management operations in Chicago

CMAQ Funded Fiber Interconnect Projects

Location	Status	CDOT Project No.	No. of Signalized Intersections	Fund Source	Total Funds Allocated (millions)	Additional Funding Required
INTERCONNECT: Peterson Avenue - Cicero Av to Ridge	Design	B-1-446	18	CMAQ	\$2.37	
INTERCONNECT: Streeterville (LSD, Michigan Ave, Chicago Ave, Randolph St.)	Design	B-1-448	41	CMAQ	\$4.14	
Near West Interconnect	Design	B-1-444	37	CMAQ	\$3.26	
INTERCONNECT: Congress - Wells To Michigan	Design	B-7-054	8	CMAQ	\$3.69	
Cermak /Ashland to MLK Dr.	Design	B-3-344	15	MPEA	\$2.22	
INTERCONNECT: Central - 63 rd Street to 51st Street	Design	W-2-102	4	CMAQ	\$1.08	
INTERCONNECT: 95 th - Western Av to Ewing Av	Design	B-4-104	25	CMAQ	\$10.31	
87th St./ Western to Dan Rayan	Design	B-4-103	15	CMAQ	\$4.01	
INTERCONNECT: Cicero - Lexington St to Peterson Av	Design	B-4-105	36	CMAQ 2008	\$10.70	
INTERCONNECT: Broadway St & Sheridan Rd - Devon Av to Hollywood Av	Design	B-5-105	16	CMAQ	\$0.37	\$4.55
INTERCONNECT: Roosevelt - Western to Lake Shore Drive	Design	B-5-107	24	CMAQ 2008	\$6.14	
INTERCONNECT: Stony Island - 95th Street to Midway Plaisance	Design	B-6-111	61	CMAQ	\$9.70	\$5.00
INTERCONNECT: Ashland - Lake to Devon	Design	B-6-148	15	County	\$6.83	
Totals -->			315		\$64.79	\$9.55
Total Funding Needs:					\$74.34	

- \$75million construction cost
- Interconnects about 300 signals
- Chicago has 3000 traffic signals
- Including TSM it costs about ~\$1 million for 1 mile of fiber interconnect
- All these projects have been in design phase for several years
- Design vendor no longer have a valid contract with the city.

Current Status

- About 250 signals were interconnected via fiber in 1990s and early 2000s
- Only a few are communicating with the central signal system now
- There is no dedicated crew or resources to maintain the fiber network
- A third of all the signals in Chicago are not coordinated/out of synch with rest of the signals on the corridor at any given time

Are there alternatives to fiber interconnects?

- Network technology has changed over the years
- Fiber not an absolute requirement for a signal interconnect
- 4G bandwidth is available in most of Chicago
- 5G rollout is planned for 2018
- There is no longer a need for bringing video through the signal interconnect
 - OEMC is offering access to a very large pool of surveillance cameras

Cellular interconnect seems promising

- Can be implemented citywide at the fraction of the cost of installing fiber
- Monthly service cost has come down significantly
- Comm require less than 200 MB of bandwidth/mo even with a one second update frequency
- Local agency do not have to worry about maintaining the network
- Large rollout possible in short time frame
 - Winnipeg, Canada interconnected 650 signals in about 8 months.

Currently evaluating two cellular alternatives

- Public / Private partnership
 - Allow private entity to monetize signal controller data in return of private entity providing network access
- Build our own cellular communication network
- Different controllers require different setup
 - Serial to IP translation for LMD40 controllers (1300)
 - Direct IP communication for ATC controllers (500)
 - One way communication using a data collection unit for HMC1000 (1000)
 - No communication possible with about 200 mechanical controllers

Option 1 - Issues

- ▶ Is this realistic over long term?
- ▶ Can we give exclusive right to the data to one vendor?
- ▶ Vendors offer is for one-way communication from the controllers?

Option 2 - Issues

- ▶ How to pay for the monthly service fee?
- ▶ Can the existing CMAQ grants to build fiber interconnect on specific corridors fund a citywide cellular interconnect?

TBD

- ▶ What to do with the existing grants?
 - ▶ Can we leverage design work already done for the 14 interconnects
- ▶ Can we complete TSMs?
- ▶ Can we build a hybrid fiber and cellular network?

Cellular Network Plan – Option 1

Key:

PROPOSED NETWORK CONNECTIONS



FIBER OPTIC CABLE

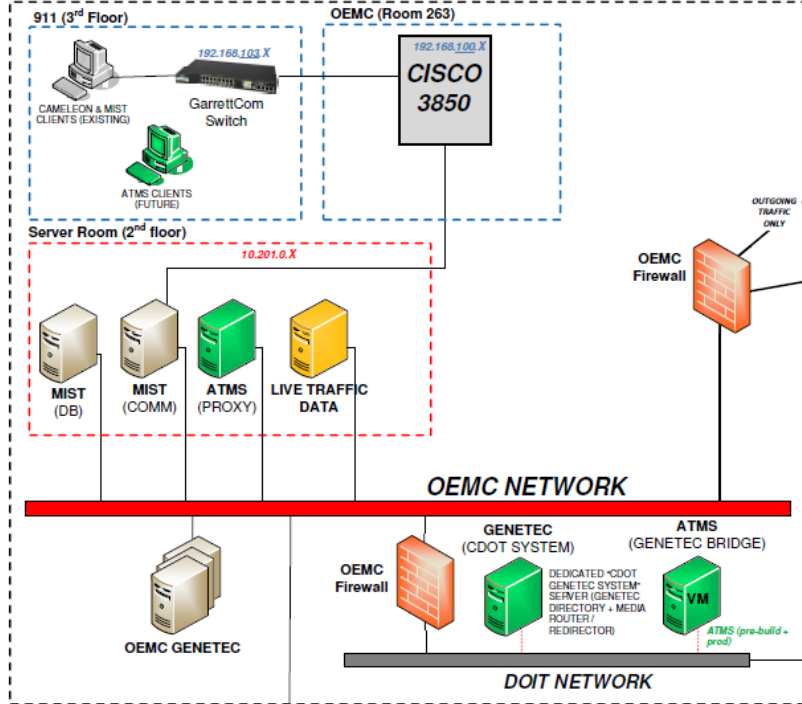


SERVER (PROPOSED / EXISTING)



3RD PARTY (LTD) EQUIPMENT

OEMC/911 CENTER



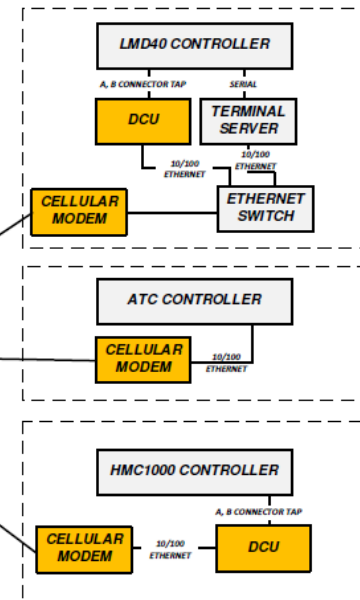
LIVE TRAFFIC DATA, LLC

OUTGOING TRAFFIC ONLY

INTERNET VPN

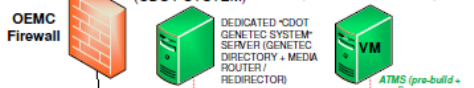
VERIZON CELLULAR

INTERSECTION CABINETS

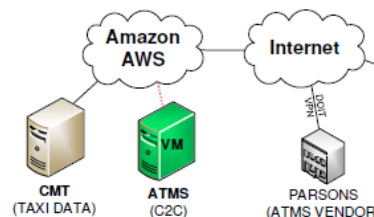
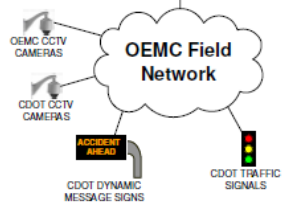


OEMC NETWORK

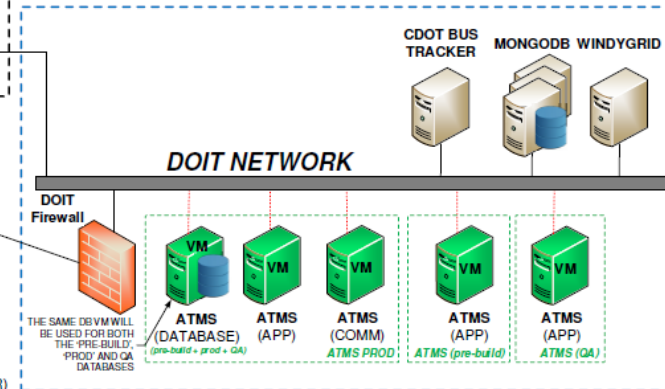
GENETEC (CDOT SYSTEM) ATMS (GENETEC BRIDGE)



DOIT NETWORK



PERSHING DATA CENTER



APPROVED AS BIDDING PLAN BY	SECTION NO.	SECTION	COUNTY	DATE	TITLE

DATE	REVISION
WORK ORDER NO.	DATE
COST ALLOCATION ACCOUNT	
APPROPRIATION ACCOUNT	MATERIAL
	LABOR
CITY OF CHICAGO DEPARTMENT OF TRANSPORTATION DIVISION OF ENGINEERING	
DESIGNED BY	DATE
CHECKED BY	DATE
IN CHARGE	DATE
SCALE	DATE



Questions?

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