## NOACA Regional ITS Architecture - Project List

Agency	Project	Service Area	Market Package	Description	Cost	Operation & Maintenance Cost (per year)	0-5 years	6+ years	Cost Source	Possible Agreements
ODOT	Regional ODOT Freeway	Traffic Management, Maintenance &	ATMS01: Network Surveillance	To include TMC, DMS, CCTV, Flow detection, freeway service patrols, hybrid	\$18,000,000		\$18,000,000			ODOT & OTC
	Management System	Construction, and Emergency	ATMS04: Freeway Control	communications system, HAR, ramp metering, web-based services and inter-						
		Management	ATMS06: Traffic Information Dissemination	agency communications network.						
			ATMS07: Regional Traffic Control							
			ATMS08: Incident Management System	Many agencies (GCRTA, CECOMS, Cuyahoga County Emergency						
			ATMS12: Virtual TMC and Smart Probe Data	Management, etc) expressed a need to view information on CCTV and DMS						
			MC03: Road Weather Data Collection	from Cleveland Freeway Management Project.						
			MC04: Weather Information Processing and Distribution	_						
			MC06: Winter Maintenance	_						
			MC07: Roadway maintenance and Construction	-						
			EM01: Emergency Response	-						
ODOT	ODOT EME E-maile	The CC - Management	EM04: Roadway Service Patrols	E-( - 1 ODOT EMC ( 11 1-) 1						
ODOT	ODO1 FMS Expansion	Traffic Management	A1MS01-4: Network Surveillance	Target the installation to meet needs. Full instrumentation may not be required.	In House Cost			In House Cost	ODOT Stakeholder Meeting	
ODOT/County	Computer Aided Dispatch	Emergency Management	EM01-7: Emergency Call-Taking and Dispatch	Develop software to export traffic incidents input to CAD systems, and import						
	Integration w/ ODOT FMS			the information to ODOT. Assumes 3 different CAD vendors, and 5 additional	\$500,000	\$5,000		\$500,000		
				connections. Consider City of Cleveland.						ODOT & County
ODOT	ODOT GPS System	Maintenance & Construction and Emergency Management	MC01: Maintenance and Construction Vehicle Tracking	For maintenance and construction vehicles.						
			EM02: Emergency Routing							
ODOT	511 Information System	Traffic Management	ATMS06: Traffic Information Dissemination	Traveler information by dialing 511 number; provided by ODOT and private partnership.		\$35,000				
ODOT	DMS	Traveler Information	ATMS06: Traffic Information Dissemination	Color DMS for inbound traffic						
ODOT	Highway Advisory Radio Signs	Traveler Information	ATMS06: Traffic Information Dissemination	Drivers would be warned by flashing beacons to tune their radio to a specific						
				frequency to hear important messages. Recent advances in HAR systems allow						
				adjacent radio transmitters to be synched to avoid interference and broadcast						
				consistent messages.						
ODOT	Increase Service Patrols	Emergency Management	EM04-1: Roadway Service Patrols	Increase frequency on existing routes and expand geographic coverage. Purchase	e					
				additional service patrol vehicles - two additional vehicles in Ohio.	\$515,000	\$175,000	\$515,000			
ODOT	Maintenance Vehicle Upgrade	Maintenance and Construction	MC01-3: Maintenance and Construction Vehicle and Equipment Tracking	Automatic Vehicle Location for maintenance vehicles.	\$1,000	\$350/Vehicle		\$1,000	US Dept. of Transportation ITS 2005 Update Benefits, Costs and Lessons Learned	
ODOT	Install snow and ice detection	Maintenance and Construction	MC06-4: Winter Maintenance	Pilot project to assess use of road weather information systems integrated with						
	management and advanced snow			advanced technology snow plows. These systems provide early warning of icing	5					
	plow systems.			and snow, and meter the amount of chemical and/or sand applied based on	\$1,000,000	\$30,000		\$1,000,000	http://www.itscosts.its.dot.gov	
				surface conditions, including amount of chemical already applied. Savings in	\$1,000,000	\$50,000		\$1,000,000	http://www.hiscosts.his.doi.gov	
				chemical and sand, and reduction of ice and snow-related incidents are						
				anticipated.						
ODOT	Freeway Lane Control	Traffic Management	ATMS04: Freeway Control	Permanent overhead signs to facilitate merging/use of shoulders						
ODOT	Work Zone Safety Improvements	Maintenance and Construction	MC09-3: Work Zone Safety Monitoring	Improvements to work zones to reduce collisions. Ability to alert drivers of a	\$100,000/Zone	\$5000/Zone	\$100000/Zone		http://www.itscosts.its.dot.gov	
ODOT	Highway-Rail Intersection	Traffic Management	ATMS13-4: Standard Railroad Grade Crossing	construction zone, roadway hazard, or speed change. Install advanced Highway-Rail Safety Systems at key crossings. A study must be	e \$1.000.000	\$50.000	\$1.000.000			
	Advanced Safety Systems			conducted to identify the crossings and the preferred system.						
ODOT	Expand Traveler Information	Travel Information	ATIS01-2: Broadcast Traveler Information	Implement additional traveler information dissemination methods which may						
	Delivery Methods			include cable TV station; personalized traveler information on a subscription						
				basis delivered to cell phones, pagers, personal computing devices, etc.;						
				connections to private sector service providers that provide content for in-vehicle	¢ \$1.500.000	\$250.000		\$1.500.000		
				computing devices; and other means that may emerge in the future. This should	\$1,200,000	Q200,000		\$1,000,000		
				be implemented via a public-private partnership. The key public sector cost						
				element will be in infrastructure to enable providing enhanced content to the						
				private sector.						
ODOT	Install Information Kiosks (Airport,	Travel Information	ATIS02-1: Interactive Traveler Information	Implement multi-modal traveler information kiosks connected to Cleveland FMS	s					
	Stadiums, etc.)			at airport, key work sites, stadiums, etc. (5 kiosks in Ohio)	\$625,000	\$50,000		\$625,000		
										ODOT & Private Providers
ODOT	Public Radio Station	Travel Information	ATIS-1-2: Broadcast Traveler Information	Purchase a commercial power radio station to be used primarily during rush hou	\$250,000	\$250,000		\$250,000		
				and special events. Consider partnering with CSU.						

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NOACA	Signal System Upgrades	Traffic Management	ATMS03: Surface Street Control	Signal upgrade and coordination along the major evacuation routes		····· (•·· ) ···· )				
NOACA	Signal System Upgrades and Integrated Corridor Management	Traffic Management	ATMS07: Regional Traffic Control ATMS03: Surface Street Control ATMS07: Regional Traffic Control	Regional signal coordination system including freeway and arterial coordination system. Integration of arterial and freeway management systems along with transit in major corridors to improve overall corridor throughput. Includes development of concepts of operations, operational procedures, center-to-center interfaces, and integrated operational plans. Study corridor for potential improvements in signal progression, detection, DMS, and CCTV placement and						
NOACA	Animal Detection System	Traffic Management	ATMS06: Traffic Information Dissemination	implementation. Placed at strategic locations where vehicle-animal crashes are frequent, this system can help warn drivers when large animals are present. The system detect motion by large animals using break-the-beam or area-cover sensors and then causes warning lights to flash. FHWA study in Montana has been completed and results are presented in final Reliability of Animal Detection Systems Report	\$165,000 (per one mile section)	\$165,000 (per one mile section)			http://www.itscosts.its.dot.gov	
County	Commercial Vehicle Ops	Commercial Vehicle Operations	CVO03-1: Electronic Clearance	System collecting data carried in trucks traveling on specific routes.	\$150,000	\$25,000		\$150,000	http://www.itscosts.its.dot.gov	
County	Evacuation Plan Updates	Emergency Management	EM09-1: Evacuation and Reentry Management	Study and development of plan to evacuate Cuyahoga County in case of an emergency affecting mass area.	\$300,000	\$3,000	\$300,000			
Municipalities	Signal pre-emption	Emergency Management/ Traffic Management	EM02: Emergency Routing	Pre-emption signal system for emergency vehicles						
Municipalities	Computer Aided Dispatch to Emergency Vehicles	Emergency Management	EM01-7: Emergency Call-Taking and Dispatch	Integrating the computer aided dispatch to the emergency management center that will allow the operators to dispatch emergency response vehicles to the scen more rapidly.	\$150,000	\$2,500		\$150,000		
City of Cleveland	Automated Parking Facilities	Traffic Management	ATMS16-1: Parking Facility Management	Possible IntelliDrive applications to assist travelers through on board devices.	\$35,000/ Garage	\$3000/ Garage		\$35,000/ Garage	http://www.itscosts.its.dot.gov	
City of Cleveland	Special Event Traffic Planning	Traffic Management	ATMS08-06: Traffic Incident Management	Development of plans, procedures and systems to improve traffic conditions associated with special events such as concerts, sporting events, or festivals.	\$250,000	\$30,000		\$250,000	http://www.itscosts.its.dot.gov	
City of Cleveland/ Cuyahoga County Port	Port Security Camera Installation	Emergency Management	EM05-2: Transportation Infrastructure	With the aid of Homeland Security Funding, cameras will be installed underneat existing bridges along the Cuyahoga River to monitor river traffic.	\$1,200,000	\$50,000	\$800,000			City of Cleveland & Cuyahoga Port
Cuyahoga County Port Authority (Aimort)	Automated Parking Facilities	Traffic Management	ATMS16-1: Parking Facility Management	Automated parking facilites to show available parking at the airport	\$35,000/Garag e	\$3000/Garage		\$35,000/Garage	http://www.itscosts.its.dot.gov	Autority
(Airport) Cuyahoga County Port Authority (Airport)	Electronic Payment Collection	Traffic Management	ATMS10: Electronic Tolling	Automated payment collection.						
Cuyahoga County Port Authority (Airport)	Vehicle Classification Notification	Commercial Vehicle Operations	CV006: Weigh-in-Motion	Weigh incoming vehicles and direct those over a certain weight to the necessary roadway for deliveries.						
Cuyahoga County Port Authority (Airport)	DMS	Traveler Information	ATMS06: Traffic Information Dissemination	DMS signs in allocated parking locations to provide incoming flight information to people picking up travelers						
GCRTA	GCRTA Passenger Management	Public Transportation	APTS4: Transit Passenger and Fare Management	System that provides fare reconciliation between peer agencies using a common						
GCRTA	GCRTA Surveillance Control	Traffic Management	ATMS01: Network Surveillance	To include CCTV at certain locations to provide surveillance at stations and surrounding areas along Euclid Corridor.	\$30,000 per location	\$3,600 per location				City of Cleveland, Cleveland State University, Case Western Reserve University, Cleveland Clinic, City of Cleveland Heights
GCRTA	GCRTA Clifton Corridor	Public Transportation and Traffic Management	APTS01: Transit Vehicle Tracking APTS02: Transit Fixed-Route Operations APTS08: Transit Traveler Information (Kiosks, signs) APTS09: Transit Signal Priority ATMS01: Network Surveillance	Similar design to Euclid Corridor for corridor along Clifton Boulevard.						RTA/Cities
GCRTA	Kiosks at Transfer Points	Public Transportation	APTS08-1: Transit Traveler Information	GCTRA to establish kiosk inside CVG airport to assist out of town users in finding their way using public transit	\$80,000	\$8,000		\$80,000	http://www.itscosts.its.dot.gov	
GCRTA	Bus Traffic Signal Priority	Public Transportation	APTS09-2: Transit Signal Priority	Study key transit corridors for applicability of bus traffic signal priority to improve transit travel time. Implement transit signal priority on traffic signals on identified corridors	\$500,000	\$1,000/Signal	\$500,000			GCRTA & Local Municipality
GCRTA/ LAKETRAN	AVL System	Public Transportation	APTS01-1: Transit Vehicle Tracking	Installation of AVL on all GCRTA and Laketran vehicles.	\$1,000/Bus	% of Capital Cost	s	\$1,000/Bus	http://www.itscosts.its.dot.gov	GCRTA & Laketran
GCRTA/ LAKETRAN	Transit Vehicle Updates	Public Transportation	APTS08-1: Transit Traveler Information	Installation of Wireless Internet Feed on buses, automated signs, and annunciators.	\$2,500/Vehicle	\$250/Vehicle	\$2,500/Vehicle		http://www.itscosts.its.dot.gov	GCRTA & Laketran
Laketran	Google Transit	Public Transportation	APTS08-1: Transit Traveler Information	GCRTA will pair with Google to feed information on Google transit.	No Cost	No Cost	No Cost			
Lakeuran	weno venicie opdates	ruone transportation	Ar 1510-1: 11ansu Passenger Counting	real-time count of population on a bus at a given time.	\$10,000/Bus	\$500/Bus		\$10,000/Bus	http://www.itscosts.its.dot.gov	

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Laketran	Advanced Para-Transit Scheduling and Dispatch System	Public Transportation	APTS07-1, APTS07-2: Multi-modal Coordination	Implement an advanced para-transit scheduling and dispatch system at Laketran coordinated with GCRTA.	\$750,000	\$35,000	\$750,000			
Rail Transit Operations	Light Rail Operations Center	Public Transportation	APTS07-1: Multi-modal Coordination	Light rail option for special events occurring at the stadiums to help alleviate special event traffic congestion downtown.	-	-		-		
CSU	Research Program	Traffic Management	ATMS19-1: Speed Monitoring	Establish a research program, in conjunction with ODOT, to test new implementation concepts such as crash mitigation or work zone operations systems.	\$600,000		\$600,000			
Private providers	Connection of Private Providers	Travel Information	ATIS-1-2: Broadcast Traveler Information	Private providers to work with ODOT to establish links with private providers to deliver traffic information to more people in different facets.	\$500,000	\$50,000		\$500,000	http://www.itscosts.its.dot.gov	ODOT & Private Providers
	IntelliDrive	Travel Information	ATIS10-1: VII Traveler Information	Deployment of IntelliDrive infrastructure, including roadside equipment and controller modifications, to implement vehicle-to-infrastructure (V2I) communications in the 2014-2020 timeframe (as vehicles are equipped). IntelliDrive is a suite of technologies and applications that use wireless communications to provide connectivity that can deliver transformational safety, mobility, and environmental improvements in surface transportation. IntelliDrive applications provide connectivity with and among vehicles, between vehicles and the roadway infrastructure, and among vehicles, infrastructure, and wireless devices (consumer electronics, such as cell phones and PDAs) that are carried by drivers, pedestrians, and bicyclists http://www.intellidriveusa.org/	\$40,000,000	\$2,000,000		\$40,000,000	http://www.itscosts.its.dot.gov	

The costs shown in this estimate represent an estimate of probable costs prepared in good faith and with reasonable care. HNTB has no control over the costs of construction labor, materials, or equipment, nor over competitive bidding or