

YOUNGJAE JU, PE, PTOE, Network+ Project Manager/Traffic Systems Engineer

Jae has a diverse background in traffic systems engineering. His 16 years of experience includes recognition as a professional engineer with certified expertise in traffic operations and communication networks. He has served as system manager and program manager for signal systems, managed expressway traffic operations, designed traffic signal systems, performed traffic studies, optimized signal timing, developed traffic simulation models, planned and designed intelligent transportation systems (ITS) for freeways and arterials, designed hardware and wireless communications, and inspected the installation of traffic signal systems. Jae's project experience includes:

Chicago Transit Authority Wilson Transfer Station, Chicago, IL (January 2012-present) (#57687) - Lead communications system engineer for numerous systems of the new Wilson Avenue transit station. The communications design includes existing and new fiber-optic communications backbone, 50-pair copper backbone cabling, CCTV camera monitoring, SCADA control system, audio/visual public address system, dynamic message signs, digital advertising signs, and provisions for future implementations such as interactive customer displays and wireless access points for trains and buses. This estimated \$100+ million project involves extensive coordination with multiple design disciplines and third-party communications infrastructure in order to stage construction for minimal network downtime. The project provides a completely new Wilson Transfer Station with new tracks and elevated structure, and expanded and modernized access, while maintaining historic building characteristics in the surrounding area.

Zoo Interchange Design, Milwaukee, WI (January 2012-present) (#57687) - Lead communications system engineer for designing the fiber-optic and wireless communications network for traffic signal systems along arterial roadways surrounding the Zoo Interchange. The signal systems will serve local traffic mobility during interchange reconstruction and be part of a broader Integrated Corridor Management (ICM) strategy. Jae also served as the technical reviewer for the ITS design along the freeway system.

O'Hare Airport ATS Shuttle Bus Operational Analysis, Chicago, IL (April 2012-May 2012) (#30120) - Lead traffic engineer for analyzing temporary shuttle bus operations during planned suspension of the Automated Transit System (ATS) service between long-term parking and the airport terminals. The analysis included field reconnaissance and data collection, development and calibration of a microscopic simulation model using CORSIM, and the determination of a shuttle bus operation schedule that delivers service comparable to the existing ATS during its shutdown.

I-94 Truck Parking Information and Management System, Southwest Region, MI (April 2012 - present) (#56108) - Project engineer for developing project ITS architecture, coordinating updates to the regional

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Education

MS, Civil Engineering, 2004,
Transportation Systems Analysis
and Planning, Northwestern
University, Evanston, IL

BS, Civil Engineering, 1996,
Transportation Facilities, University
of Illinois at Urbana-Champaign,
Champaign, IL

Registrations

Professional Engineer:
IL, 2000 (#062-054024)

Professional Traffic Operations
Engineer (PTOE), 2003 (#1223)

Network+ Certified Professional,
2009 (#COMP001008262552)

Certified Mesh Network Engineer,
Firetide FCME, 2010

Affiliations

Institute of Transportation Engineers
- Illinois Section Web Site Committee
Chair

ITS architecture, developing the concept of operations, detector technology evaluations, and technical design reviews. The I-94 Truck Parking Information and Management System will involve the timely and reliable dissemination of information regarding truck parking availability to interested users. The I-94 project corridor, extending from the Indiana border to I-69, is a critical link for international trade. The significant number of truck parking facilities within the corridor creates the need for real-time information related to truck parking. The system will measure parking availability and provide parking information over a variety of media, including dynamic parking information signs, a mobile phone application, the MiDrive website, and through connected vehicle technology.

ITS Design and System Manager Services for I-275; I-75 to I-96/M-14 Interchange, Wayne and Monroe Counties, MI (Ongoing) (#56108) -

Communications technical adviser and design leader for retrofitting existing ITS field devices into the proposed communications network for this ITS design and system manager services project for I-275. The project includes 20 miles of new fiber optic cable and conduit interconnecting new and existing CCTV cameras, vehicle detectors, and dynamic message signs. The communications system uses Layer 3 switches at devices locations to provide a fully redundant, routed network the ties into the regional backbone fiber system.

Amtrak Yard Surveillance and Control System, Chicago, IL (May 2010-May 2011) (#50524) - Lead communications design engineer for Amtrak's Chicago Maintenance of Equipment Facility Upgrades ARRA project. HNTB is teamed with Kiewit Western Corporation for this fast-paced, design-build project to rehabilitate facilities in Chicago Union Station and Terminal. The project includes the design and construction of a yard, interlocking and main tracks, rehabilitation of five major facilities, trackside utilities, switch and derail machines, CCTV IP camera network in support of yard control, power and bridge structures. The network included wireless and fiber optic communications, Ethernet/IP network in a mesh/ring topology, multiple control centers, and network video storage system. HNTB led the design effort to move the 30-percent design provided in the project bridging documents to the design issued for the construction of the facility.

UPA I35W/TH77 System Design, Minneapolis, MN (July 2008-2009) (#47309) - Project engineer responsible for developing the concept of operations, system requirements, high-level design, and request for proposal for the Park & Ride Space Availability System component of the overall Customer Information System vision. Concepts were incorporated from several existing documents, including a technology implementation framework, preliminary roles and responsibilities, and system requirements and operational concept for integrated corridor management. Regional stakeholders were engaged to gather input to incorporate into the operational concept, system requirements, and high-level design. Testing requirements were developed based on traceability to system requirements and concept of operations. The request for proposal included the development of final detailed design, as well as implementation to meet the aggressive project schedule dictated by funding requirements.

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Grand Rapids ITS Expansion Design (Dec. 2007-Aug. 2011) (#44120) -

Communications engineer responsible for wireless communications performance testing and assisting with preliminary design and system requirements of the proposed network. HNTB is currently designing the second phase of the Grand Rapids Metropolitan Area Traffic Management System. This project involves more than 40 miles of freeway and arterial management systems being installed on I-96, I-196, U.S. 131, M-11, M-37, M-44 and various other routes. The ITS systems being installed include NTCIP-compliant dynamic message signs, CCTV surveillance, microwave vehicle detectors, and traffic signal interconnects. The supporting communication system is comprised of a fully redundant Ethernet/IP mesh network operating over fiber optic and wireless media.

Traffic Signal Interconnect/ITS Program Management, Chicago, IL (Nov. 2007-June 2009) (#44867) - Program manager of the City of Chicago's traffic signal systems and Intelligent Transportation Systems (ITS). Services included coordinating the work associated with multiple traffic signal interconnect and ITS projects, obtaining utility location records for numerous corridors, overseeing communication systems design, coordinating technical and civil infrastructure components, demarcating secure/public system elements, overseeing system implementation, developing signal timing optimization procedures, managing the development of design standards, providing technical advisement, developing progress tracking tools, securing project funding, and developing contracts for consultant/contractor services. The Simplify-Organize-Standardize (SOS) program management strategy resulted in City improvements to signal design procedures for photo logs, traffic data collection, topographic surveys, ADA curb ramp design, traffic signal requirements, signal timing, and design plans. These services involved working closely with City personnel as an extension of their staff.

Near West Traffic Signal Communications System Manager, Chicago, IL (June 2009-Aug. 2012) (#44867-DS-003) - Project manager serving as the City of Chicago System Manager of the communication network for the Near West Traffic Signal Interconnect project. The System Manager responsibilities include field investigations of existing infrastructure, wireless site surveys, systems engineering analysis, communication network design, and preparation of plans, specifications, and cost estimate. The project includes a complex communication design that provides wireless communication within the grid street network of the project area with numerous tall buildings. The design includes new wireless/hardwired networks integrated with several existing backhaul nodes located within the project area. The network design provides robust and reliable communication between the City of Chicago Office of Emergency Management and Communications (OEMC) building and traffic signal interconnect field devices. The System Manager is responsible for coordinating the communication network design and configuration with the OEMC and the City's Master Network Administrator to achieve compatibility with the City's existing communication network and City-wide network plan. Coordination with the City's traffic signal infrastructure designer is needed for preparing a single set of contract bid documents. System Manager

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services during the network implementation phase are anticipated under a separate task order.

Cermak Road Traffic Signal Communications System Manager, Chicago, IL (June 2009-Aug. 2012) (#44867-DS-008) - Project manager serving as the City of Chicago System Manager of the communication network for the Cermak Road Traffic Signal Interconnect project. The System Manager responsibilities include field investigations of existing infrastructure, wireless site surveys, systems engineering analysis, communication network design, and preparation of plans, specifications, and cost estimate. The System Manager coordinated with an overlapping streetscape project to have additional conduit installed in advance. The communication design utilizes the pre-planned conduit for new fiber optic communications along the corridor. The System Manager inventoried City facilities in cooperation with CDOT-Division of Electrical Operations, Chicago Office of Emergency Management and Communications (OEMC), and the Chicago Police Department to utilize existing infrastructure for backhaul communications to the OEMC. The overall network design provides communication between the OEMC building and traffic signal interconnect field devices. The System Manager is responsible for coordinating the communication network design and configuration with the OEMC and the City's Master Network Administrator to achieve compatibility with the City's existing communication network and City-wide network plan. Coordination with the City's traffic signal infrastructure designer is needed for preparing a single set of contract bid documents. System Manager services during the network implementation phase are anticipated under a separate task order.

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Ashland Avenue Traffic Signal Communications System Manager, Chicago, IL (Nov. 2009-Aug. 2012) (#44867-DS-009) - Project manager serving as the City of Chicago System Manager of the communication network for the Ashland Avenue Traffic Signal Interconnect project. The System Manager responsibilities include field investigations of existing infrastructure, wireless site surveys, systems engineering analysis, communication network design, and preparation of plans, specifications, and cost estimate. The System Manager investigated an extensive amount of underground cabling infrastructure as well as conducting wireless testing along the corridor. The communication design utilizes available conduit for the cost-effective installation of new fiber optic communications along the corridor. The System Manager coordinated with CDOT-Division of Electrical Operations to locate buried underground infrastructure, and worked closely with the Chicago Office of Emergency Management and Communications (OEMC) on a direct interface between the OEMC building and traffic signal interconnect field devices. The System Manager is responsible for coordinating the communication network design and configuration with the OEMC and the City's Master Network Administrator to achieve compatibility with the City's existing communication network and City-wide network plan. Coordination with the City's traffic signal infrastructure designer is needed for preparing a single set of contract bid documents. System Manager services during the network implementation phase are anticipated under a separate task order.

High Speed Passenger Rail, Watertown to Madison, WI (July-Nov. 2010 (#47061)) - Communications engineer for the network design associated

with proposed high speed passenger rail service along the Wisconsin & Southern Railroad (WSOR) dark territory freight rail between Watertown and Madison, Wisconsin. The communication network was designed to support both positive train control (PTC) and centralized traffic control (CTC). The network design included proposed fiber optic communication along the WSOR to tie-in proposed wayside devices, equipment bungalows, communication access points, and four train stations. Point-to-point wireless backhaul radio communications was proposed, utilizing existing communication towers to create a robust network ring topology. Proposed wayside mesh radios along the corridor and 220 MHz radios on the communication towers provide robust train communications. The communication design also included proposed fiber splicing with existing fiber along the adjacent Canadian-Pacific (CP) railroad to establish hardwire communications to the WSOR control center in Milwaukee. The project involved signals and communications, utilities, structures, roadbed, trackwork and alignment, geotechnical, drainage and a variety of other components, including positive train control, and public information involvement. The project also involved extensive coordination with FRA, CPRR, WSOR, and Amtrak to complete preliminary engineering and final design for elements of the corridor to meet a very constricted time schedule. The final design will upgrade old freight rail lines that currently operate at 10 mph.

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Mississippi River Bridge ITS Planning, Collinsville, IL (Mar.-Nov. 2009) (#29253) - Project engineer responsible for reviewing existing ITS documentation and assisting the Illinois DOT with coordinating ITS network communications with Missouri DOT. Documentation from IDOT, MoDOT, and the East-West Gateway Council of Governments was reviewed to develop an inventory of the existing system. The project elements were incorporated into the Bi-State St. Louis Regional ITS Architecture and the updated Turbo Architecture file was provided to the East-West Gateway Council of Governments. The ITS architecture change request form was also submitted in accordance with the regional ITS architecture maintenance plan. An assessment was performed of work zone ITS safety applications related to interchange reconstruction for incorporation into the overall construction bid package. A concept of operations technical memorandum and interagency agreement were prepared for the proposed internetworking between IDOT and MoDOT systems. Services also included developing ITS design requirements and assisting with having them incorporated in the civil infrastructure design.

ITS Design and System Manager, MI (2005-2007) (#41932) - Project traffic engineer for the design of closed-circuit television (CCTV) traffic surveillance cameras along three freeway corridors: I-94, I-96, and I-69. The camera deployment was part of the broader maintenance and enhancement of the Michigan Department of Transportation's (MDOT) existing ITS field devices and communications infrastructure. HNTB served as MDOT's ITS designer and system manager for the installation of CCTV cameras, highway advisory radio (HAR), dynamic message signs (DMS), vehicle detectors, lane control, and communications infrastructure.

Cicero Avenue Traffic Signal Interconnect, Chicago, IL (2006-present), (#40765) - Project manager for design of an eight-mile traffic signal

interconnect system along Cicero Avenue from I-290 to US Route 14 (Peterson Avenue). Civil infrastructure/communication design coordination is required to incorporate the communication needs into the construction plans. A wired/wireless hybrid communication network is being designed to interconnect thirty-eight signal controllers and provide communications for other field devices. Existing interagency communication infrastructure will be utilized to cost-effectively establish backhaul communication from the corridor to the central traffic signal control facility. As part of the City's design process, traffic counts were performed to develop traffic signal requirements and a calibrated Synchro base model. Optimized traffic signal timing plans were developed to balance intersection signal green time allocation with vehicle demand and capacities subject to pedestrian minimum crossing time requirements. Count data and timing plans were presented in City standard electronic forms. The project also included the design of new ADA-compliant sidewalk and ramps, upgrades to signal controllers and the deployment of system detectors.

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Chicago Skyway Traffic Operations, Chicago, MI (Aug. 2003-July 2004) (#34418) - Traffic operations director responsible for managing traffic along an I-90 corridor via a temporary traffic operations center during the Skyway bridge reconstruction. As director, Jae was responsible for strategic traffic plan development, staffing, closed-circuit television camera monitoring, dynamic message sign operations, alternate arterial route monitoring, critical movable concrete barrier configuration decisions for balancing capacity supply to directional traffic demands, traffic volume data collection, traffic demand trend analyses, performance evaluation, and direct reporting to the Department of Transportation Commissioner and Mayor's Chief of Infrastructure.

ITS Status Report and Assessment, IL (Nov. 2005-Aug. 2006) (#42997) - Project engineer for the development of a strategy for improving the Illinois Department of Transportation's (IDOT) effectiveness in ITS management and operations. Information on successful practices, obstacles and constraints was gathered by interviewing IDOT personnel and other transportation agencies as well as researching transportation literature. Eighteen common themes emerged from the IDOT personnel interviews, which were grouped into ITS focal topics: 1) vision, goals, objectives, and performance measures; 2) organizational structures and staffing; 3) design, construction, and procurement; 4) technological approach; and 5) operations and maintenance. An analysis was conducted on potential alternative solutions in the five focal topics. This analysis assessed the potential benefits and drawbacks of alternative actions and IDOT's unique environment and constraints, which led to the final recommended strategy.

Ashland Avenue Traffic Signal Interconnect, Chicago, IL (Dec. 2003-July 2004) (#35693) - Project engineer for the design of a nine-mile traffic signal interconnect system along Ashland Avenue from 95th Street to Cermak Road (22nd Street). The system interconnects forty signal controllers on a fiber communication bus network topology, which also provide communications for traffic surveillance video cameras and system detectors. The opportunity to share existing fiber infrastructure for backhaul communications was identified through coordination with other

agencies. A critical fiber link was designed and installed through an existing deep tunnel, which was identified through a thorough investigation of area utilities. Traffic counts were performed to develop a Synchro base model and optimized traffic signal timing plans that allocate intersection signal green time based on vehicular demand, capacities, and pedestrian crossing requirements. Timing plans were presented in City standard electronic forms. The project also includes upgrades to signal controllers and several signalized intersection modernizations.

Randall Road Traffic Signal Interconnect, Batavia, IL (Sept. 2008-Apr. 2009) (#46718) - Project manager for design of a three-mile fiber-optic interconnect system along Randall Road from Orchard Road to Fabyan Parkway and tie-ins with two other interconnect systems. Twenty-two signal controllers and two pan-tilt-zoom cameras are interconnected by a Gigabit Ethernet fiber backbone. The network design utilized existing fiber as well as the existing serial communications bus topology and the fiber-optic transceivers on the controllers. The central software communicates via a combination of direct connections to local controllers as well as a field master controller. Backhaul communication to central initially relies on an ISP network and DSL service, but will ultimately be replaced by the county's fiber network. The design was coordinated with subsequent projects and the overall vision for the county-wide fiber network to optimize the project's scope of work and budget.

143rd Street Traffic Signal Installation, Plainfield, IL (March-Nov. 2005) (#41507) - Project traffic engineer responsible for intersection traffic signal design. The project involved the preparation of plans, specifications, and cost estimate for the design of one mile of roadway lighting and an actuated signalized intersection using video detection, and coordination with a separate overlapping roadway widening project.

IL Route 126/U.S. 30 Traffic Signal Interconnect, Plainfield, IL (Apr. 2006-Jan. 2010) (#43302) - Project manager for the design of signalized intersections at three locations. The project includes the preparation of plans, specifications, and cost estimate; fiber-optic traffic signal system; and intersection design study. Traffic counts were performed to develop a Synchro base model and optimized traffic signal timing plans that allocate intersection signal green time based on vehicular demand and approach capacities. The project incorporates video detection, battery backup systems, and interagency coordination with state and local agencies to prepare for centralized management of traffic signals.

Madison Street Traffic Signal Design, Chicago, IL (Apr. 2006-May 2009) (#33484) - Project traffic engineer for the design of partial and full traffic signal modernizations at nine intersections along Madison Street. The project included the installation of underground conduit and manholes, signal controllers and cabinets, poles and foundations, traffic signal cable, and vehicle detection devices. As part of the City's design process, traffic counts were performed to develop traffic signal requirements and a calibrated Synchro base model. Optimized traffic signal timing plans were developed to balance intersection signal green time allocation with vehicle demand and capacities subject to pedestrian minimum crossing time requirements. Count data and timing plans were presented in City standard

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electronic forms. The project also included the design of new ADA-compliant sidewalk and ramps.

I-190 Collector-Distributor Roadway System, Chicago, IL (7/1999-7/2012) (#30120) - Project engineer for ITS planning and traffic simulation related to the redesign of the three-mile I-190 corridor (including five interchanges) as well as three miles along Mannheim Road. The ITS plan was based on input received through coordination meetings with local agencies and stakeholders as well as information in literature describing ITS activities in the region. The planning took a deployment-orientated approach by identifying ITS market packages for the corridor, thereby providing associated preliminary architecture, primary subsystems and interfaces, system functional requirements, and related standards. A preliminary assessment of the technologies available to meet the requirements was conducted. The ITS plan also included high-level design concepts showing preliminary device locations and communication infrastructure along with programming cost estimates and phased implementation schedule. Traffic simulation models were developed with CORSIM and VISSIM for multiple scenarios, including base conditions for calibration, projected no-build and projected alternative solutions. Optimized signal timings were developed with Synchro for Bessie Coleman Dr. and Mannheim Road as part of I-190 integrated corridor simulations. The modeling identified projected roadway deficiencies and served as a cost-effective tool for developing initial alternative solutions and refining them to a recommended roadway configuration.

Detroit Emergency Operations Center/Traffic Management Center, Detroit, MI (Jan. 2005-Sept. 2008) (#41314) - Project engineer for the plans, specifications, and estimates for a wireless signal interconnect system in the Detroit central business district, which is managed at the new traffic management center. The system includes closed-circuit television cameras; emergency vehicle preemption; system detectors; and 900 MHz and 5.8 GHz wireless communications.

143rd Street (Gin Mill Road) Reconstruction, Plainfield, IL (Mar.-July 2005) (#29547) - Project traffic engineer responsible for designing the maintenance of intersection signalized control during proposed roadway reconstruction of the Will County Department of Highways. The project involved temporary traffic signal installation, signal modernization, and coordinating signal timing with the existing signal interconnect system along IL Route 59. In addition, the project includes complete reconstruction of 1.1 miles of 143rd Street, including modification of the existing rural cross section to an urban cross section, a new drainage system, and box culvert replacement, and preparation of right-of-way plats.

Traffic Management Center Design/Signal System Upgrade, Lake County, IL (Feb.-Sept. 2004) (#39261) - Project engineer who coordinated civil and communication designs, conducted field investigations, and prepared contract documents for an arterial advanced traffic management system. The system covers approximately 170 intersections interconnected by fiber optic cable to the new Lake County Traffic Management Center. It is deployed throughout the county, and coordinates traffic signals across multiple jurisdictions. The system was designed to communicate with NEMA

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traffic signal controllers by Econolite and Eagle/Siemens ITS manufacturers. In addition to signal control, the arterial fiber-optic communications network is utilized for digital video transmission and control of pan-tilt-zoom cameras and control of highway advisory radio and dynamic message signs. A gigabit Ethernet backbone communication system is configured on the fiber-optic network. The field devices are managed at the traffic management center to monitor traffic, identify incidents, adjust signal timing, and disseminate traveler information to motorists to aid in making informed travel decisions.

West Lake (East Lake) Avenue Tri-State Tollway to Patriot Boulevard, Glenview, IL (May-Oct. 2004) (#33021) - Project traffic engineer responsible for designing the maintenance of intersection signalized control during proposed reconstruction of two miles of roadway. The project involved traffic signal modernization at five intersections and coordination with a separate intersecting roadway project.

Raceway Associates Speedway, Joliet, IL (May-Aug. 1999) (#30923) - Project traffic engineer for design engineering services for this \$120 million design-build project. Jae's responsibilities included the analysis of ingress and regress traffic flow demands and the design of intersection signalization. This 930-acre motor sports facility consists of a 1.5-mile tri-oval racetrack with grandstands, luxury suites, concessions, restrooms, garages, offices, emergency care facilities, press/media facility, and maintenance buildings.

Illinois Tollway Dynamic Message Signs (Oct. 2003-Mar. 2004) (#39129) - Project engineer for design plans, specifications, and cost estimate for an expansion of the Illinois Tollway's Intelligent Transportation System (ITS) field devices. Twelve NTCIP-compliant dynamic messages signs (DMS) and closed-circuit television (CCTV) cameras were deployed on more than 60 miles of the Tollway system. DMS included both roadside and overhead support structures. Preliminary roadside device sites were investigated and finalized for final design within an aggressive six-month project schedule.

Marquette Interchange Reconstruction, Milwaukee, WI (Aug. 2003-Mar. 2005) (#36667) - Project engineer for the development of an ITS Operations and Maintenance (O&M) plan. The plan summarized the challenges and lessons learned from the O&M practices of transportation agencies throughout the country and related them to WisDOT. The plan also assessed the effects of proposed interchange geometric improvements on existing ITS infrastructure, operations, and maintenance; and identified potential funding sources. The O&M plan was an integral part of ITS design, which included new ramp meter facilities, new CCTV camera installations for monitoring traffic, new vehicle detection systems and major modifications to the existing fiber optic communications system infrastructure. The maintenance of the existing Freeway Traffic Management System (FTMS) and system enhancements were incorporated into the overall construction staging of the project. This complex project involved a five-level system interchange, four miles of interstate, 28 ramps, over 60 bridges, five miles of retaining wall, constrained geometrics, context-sensitive solutions, property and utility relocations, and major structural and drainage design. Extensive mitigation and public information

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campaigns, including a Traveler Information System (TIS) web site, were carried out to provide transportation choices and inform motorists of available routes during construction. The project won two Regional PACE (Public Affairs and Consumer Education) awards through AAMVA (American Association of Motor Vehicle Administrators) and the Best of State Award, American Council of Engineering Companies, Wisconsin chapter.

Shermer Road Reconstruction, Glenview, IL (Jan. 2005-Feb. 2006)

(#35467) -Project traffic engineer responsible for designing the maintenance of signalized control during proposed reconstruction and modernization of intersection traffic signals. The project is 8,770-feet-long and includes the complete reconstruction of Shermer Road within the project limits. Traffic signal modernization was provided at three intersections. The project provided one lane of traffic in each direction with channelization at major intersections. A two-way left-turn lane was provided for the northern portion of the project, approximately one-quarter mile in length. HNTB's work included field surveys, plat preparation, traffic counts, geotechnical report, traffic projections, report preparation, and contract plan preparation.

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Metra Parking Management Guidance System, Chicago, IL (June 2002-

Mar. 2006) (#35903) - Project engineer for site evaluations and contract bid document preparation for Metra's first parking management guidance system (PMGS) deployment. The project included traffic management and traveler information components and an evaluation of the system's effectiveness. Site evaluations considered origin-destination data, roadside device constructability, traffic volume and roadway capacities, effectiveness for timely travel decisions, and construction cost. An operational concept, communication architecture, and traffic management routing scenarios were developed prior to developing final design plans and specifications for bid. Construction management assistance was provided to help oversee the awarded contractor's implementation of the system.

Midway Airport Elevated Parking Structure, Chicago, IL (Jan. 2001-Feb.

2003), (#29868) - Project traffic engineer responsible for studying the traffic impacts from the new \$65 million, state-of-the-art elevated parking structure at Midway Airport and as well as a planned rental car facility. The operational effects on the adjacent roadway system were analyzed to identify deficiencies and develop solutions. The analysis results were incorporated into the design plans for a new signalized entrance to the parking structure, taking into account the signal coordination needs with the adjacent intersections.

Regional ITS Architecture for Northeastern Illinois, Northeast IL (Mar.-

Dec. 2002) (#35795) - Project engineer who assisted in the development of a regional ITS architecture, which represents a 15-year planning outlook for transportation systems integration in the six-county NE Illinois region. Services included a technical review of existing architecture documents such as the Gary-Chicago-Milwaukee Architecture and the Tier 2 Regional ITS Architecture to develop an operational concept and base regional ITS architecture using the Turbo Architecture tool. Assistance was provided to the Illinois Department of Transportation (IDOT) and the Chicago

Metropolitan Agency for Planning (CMAP), formerly Chicago Area Transportation Study (CATS), with stakeholder outreach to define and clarify architecture elements, integration opportunities, information resources and exchanges. A summary of the communication infrastructure within the architecture was developed. Maintenance guidance was also provided on the responsibilities and procedures for maintaining the regional ITS architecture to incorporate project ITS architectures, changes in agency plans, and technology advancements.

Comprehensive Plan, Glenview, IL (Oct. 2001-Feb. 2002) (#35014) - Project engineer responsible for field investigation and assisting with the evaluation of potential bicycle and pedestrian facilities. HNTB reviewed existing transit, pedestrian and bicycle system information to identify potential obstacles to their operation. Various informational sources were reviewed including Village's comprehensive plan; Northwest Municipal Conference data on priority travel zones, existing and proposed bicycle routes, and goals and objectives; proposed improvements in the Northeastern Illinois Transportation Improvement Plan; Metra commuter rail and Pace bus service schedules and travel data; and existing roadway facilities. HNTB analyzed existing conditions to develop recommended improvements for traffic and transit flow, and pedestrian and bicycle safety.

Indiana Toll Road ITS Master Plan, IN (Feb.-July 2001) (#30870) - Project engineer for developing a plan for ITS implementation. An advisory committee of diverse representation (police, maintenance, operations, communications, patron services, collections, payroll, and executives) was formed to guide the planning efforts. The master plan included an inventory of the existing system, an ITS Market Package analysis, a system architecture, a preliminary incident management plan, and a deployment plan for ITS implementation.

U.S. Route 20 (Lake Street), Elmhurst, IL (Nov. 2000-Mar. 2002) (#31713) - Project engineer for traffic engineering services for the preparation of phase II contract plans for the Illinois Department of Transportation. The project included the complete reconstruction of 1.8 miles of urban roadway, including the deck and beam replacement of the U.S. Route 20 bridge over Illinois Route 83. Responsibilities included the design of a fiber-optic signal interconnect system for seven signalized intersections.

Gateway Traveler Information System (TIS), Gary-Chicago-Milwaukee Corridor (Feb. 1999-Aug. 2001) (#28990) - Project engineer who coordinated the development of the GCM Communicator website for the Gateway TIS. The Gateway TIS will serve as the corridor hub of the multi-modal traveler information system that will serve the needs of travelers and operators within the GCM corridor. The system will focus on collection and distribution of transportation related information and coordination of regional multi-modal transportation systems. It will also provide the communications mechanism for the implementation of cooperative control procedures for cross agency control of ITS devices. The GCM communicator provides GCM committee members with online communication services,

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including electronic file transfer (FTP), online discussion groups, email, and a calendar of upcoming events.

North-South Arterial Feasibility Study, DuPage County, IL (10/1999-6/2000) (#27097) - Project traffic engineer for a feasibility study for a new five-mile long north-south arterial roadway in western DuPage County. Three corridor alignments were defined and evaluated based on the impacts associated with each. The assessment includes traffic operational analyses along several arterials and signalized intersections based on several traffic forecasts scenarios provided by DuPage County. The results aided in determining the roadway characteristics needed to accommodate the forecasted travel demand. The assessment also included wetland and floodplain impacts; noise and accident analysis; and coordination with affected agencies. Jae also coordinated the development of a project website.

I-90/94 Kennedy Expressway Traffic Study, Chicago, IL (June 1997-May 2000) (#17663) - Project traffic engineer for conducting a traffic study in the Chicago downtown area that surrounds the seven consecutive ramp interchanges. The study evaluated the effects on traffic flow along the freeway and surface streets due to the removal of several ramps. Ramps were temporarily closed to investigate the possibility of improving traffic flow and safety at merging and weaving sections along the interstate. Traffic on the freeway and surface streets was monitored during the test closure period. The data collected included traffic observations, traffic counts at signalized intersections, and data from loop detection stations along the freeway. The traffic operational analyses were summarized and presented to IDOT and FHWA. Jae received individual recognition for his impressive and excellent work on the IDOT Consultant Performance Evaluation.

Division Street, Chicago, IL (Aug. 1999-May 2002) (#15544) - Traffic engineer for a Phase I Categorical Exclusion Report and Phase II plan preparation services for 6.2-miles of urban arterial. The studies included analysis of 28 signalized intersections, viaduct clearance improvements, traffic counts and analysis, as well as extensive public coordination with four public information meeting. Jae was responsible for traffic data collection and analyses, and evaluation of intersection geometrics.

Borman Expressway Advanced Traffic Management System (ATMS), Northern IN (Aug. 1998-Oct. 1999) (#28523) - Project engineer for this project, which involved project management, systems design, construction services, software development, system integration and operations support, training and documentation for the Borman Expressway Advanced Transportation Management System (ATMS). HNTB has primary responsibility for project management, as well as preparation of contract plans, specifications and cost estimates for system components and the TMC. Jae's responsibilities included designing microwave and inductive micro-loop vehicle detector stations and highway advisory radio flasher signs, client and subconsultant coordination, data analysis and preparation of plans, specs and estimates.

Eastern Ring Road, Peoria Metropolitan Area (May 1996-Feb. 1999) - Project engineer who assisted in the comparison of three potential

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transportation corridors. Engineering services included assessing three potential transportation corridors, recommending one for further detailed study, performing alignment studies within the selected corridor, assessing environmental and socio-economic impacts, organizing public meetings, and preparing reports and a corridor protection map.

Multi-Modal Traveler Information System (MMTIS), Gary-Chicago-Milwaukee Corridor (1997-1998) - Project engineer for development of coordinated policies and guidelines working paper for variable message signs (VMS) and highway advisory radio (HAR) operations. A series of meetings facilitated the sharing of VMS/HAR practices, lessons learned, and issues among transportation agencies within the Gary-Chicago-Milwaukee corridor. The paper provides an overview of issues and documents the consensus reached by agencies on a variety of topics, such as message content, format, and length; passive and active diversion; terminology; and legal issues. The MMTIS focuses coordination among multiple transportation modes to support efficient travel across different modal boundaries.

Pilot Travel Center Traffic Impact Study, Minooka, IL (1998) - Project engineer for this project which involved a traffic impact study initiated by the Pilot Corporation as part of its proposal to develop a Pilot Travel Center at the southwest quadrant of the eastbound I-80 exit ramp at Ridge Road. The development is designed to provide the services of a truck stop, convenience store and a gas station. The study analyzed two intersections: Ridge Road and the eastbound I-80 exit/entrance ramps and Ridge Road and the westbound I-80 exit/entrance ramps. Jae was responsible for data collection, the analysis of existing and proposed operational performance of these unsignalized intersections, and the preparation of a traffic impact study report.

Pilot Travel Center Traffic Impact Study, Romeoville, IL (1998) - Project engineer for a traffic impact study initiated by the Pilot Corporation as part of its proposal to develop a Pilot Travel Center near the I-55 interchange at Weber Road. The development is designed to provide the services of a truck stop, convenience store and a gas station. The study analyzed three signalized intersections: Weber Road and the eastbound I-55 exit/entrance ramps, Weber Road and the westbound I-55 exit/entrance ramps, and Weber Road and Normantown Road. Jae was responsible for data collection, the analysis of existing and proposed operational performance of these signalized intersections, and the preparation of a traffic impact study report.

Brach & Brock Confections Driveway Improvement, Chicago, IL (1998) - Project engineer for design, plan preparation, and permit assistance for a driveway improvement for the Brach & Brock Confections facility. Jae was responsible for the design and plan preparation of the improvement to an entrance driveway and assisted in the development of the cost estimate.

Traffic Study, Oak Lawn, IL (1997) - Project engineer for this project which involved a study of the travel patterns in the southwest quadrant of 95th Street at Cicero Avenue for the Village of Oak Lawn. Local residents expressed concerns about high volumes of traffic using the neighborhood street system. HNTB performed a traffic investigation, analyzed the

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efficacy of a plan proposed by the Village, and presented recommendations in a report. Jae was responsible for the field investigations, review of the proposed plan and making recommendations in a written report.

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