



SCOPE OF WORK

Non-Project Specific Traffic Engineering Scope of Services

Provide Traffic Operations Support as follows:

- Collect traffic data as needed for design and operations analysis.
- Perform traffic studies or analyses utilizing the latest technology including but not limited to; Streetlight data and street simplified or other approved technology.
- Perform, review, and provide technical support on various travel demand and traffic operations models including, but not limited to VISSIM, CORSIM, SYNCHRO, HCS, and CDOT approved roundabout software.
- Perform, review, and provide technical support on safety analysis using the Highway Safety Software (HSS).
- Perform traffic analysis to implement construction phasing to optimize traffic flow during construction.
- Prepare new and/or update existing Incident Management plans and Lane Closure Strategies as requested. This includes the development of actual plans or strategies, manuals and meeting documents.
- Conduct accident analyses needed for consideration of safety measures in the designs and planning of transportation projects. Accident history will be provided by CDOT in most cases.
- Provide staff for special projects like corridor incident management/response with towing companies (e.g. courtesy patrol, heavy tow, other). Provide staff to conduct traffic studies regarding speed, progression, congestion, incidents, removal of vehicles, etc. and provide staff as needed to compliment the Region operations offices in all capacities.
- Perform individual signal timing plans, corridor signal timing progression plans and optimization plans.
- Provide miscellaneous services regarding traffic operations to help with the Region's Day-to-day operations.

Provide Traffic Design Support as follows:

- Design, prepare and deliver construction plans and specifications for all types of Traffic and ITS Projects to meet CDOT, City, or County requirements, including but not limited to:
 - Major roadway reconstruction (road diets and associated infrastructure), including but not limited to designs of curb gutter, subsurface drainage systems, sewer, sidewalk, lighting, and other related items.
 - Traffic signals (LED displays, mast arm designs, etc.).
 - Vehicle detection system (video, loop, microwave, radar, ultrasonic, etc.).
 - Interconnect systems (hardware, phone, cellular phone, spread spectrum, radio, etc.).
 - Pavement markings (tape, thermoplastic, water based, etc.).
 - Sign and sign support systems (wood, metal and composite systems).
 - Other intelligent transportation systems devices (variable message boards, closed circuit television, fiber optics and other communications media etc.).



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- Intersection designs (simple lane additions, signalizations, continuous flow intersections, diverging diamonds, and roundabouts).
- Preliminary surveys for designs.
- Sign layouts.
- Guardrail designs.
- Roadway re-striping and roadway design.
- Calculate quantities and estimates for plans.
- Fiber optic networking drawings and fiber optics splicing plans.
- ITS Network plans for interconnection to the Colorado Traffic Management Center (CTMC), Nodes/Regions and Tunnels.
- ITS Network Support Plans.
- Furnish detailing and drafting services.
- Roadway surveying with a PLS Stamp as required, traffic control and permits will be required.
- Review and/or design structural shop drawings for Traffic signals, specialized Traffic sign supports, ITS structures (cantilevers, butterfly, two posts, bridge attachments for conduit, light poles and others as requested).
- Provide Geotechnical recommendations and reports regarding test hole boring, classifications analyses, concrete and asphalt testing.
- Provide hydraulics engineering services and support.
- Prepare construction and maintenance related signing plans and schedules. Develop conceptual phased construction plans considering geometric design, capacity analysis, construction signing, temporary guide signing, temporary pavement markings and temporary signal design.
- Prepare freeway guide signing plans consistent with the MUTCD and CDOT's practices and policies. Prepare sign bridge plans, specialized sign support details, MLOS sign plans and sign layouts using current CDOT programs.
- Railroad consultants provide railroad crossing design and coordination services, railroad flagging, railroad permitting for utilities, railroad signal design and consulting services, railroad crossing diagnostics, inspections and construction oversight.
- Provide Subsurface Utility Engineering (SUE) Design and Support as follows:
 - Conduct utility investigations and prepare utility plans that comply with ASCE 38. This may include Quality Level A through D methods of investigation and #D CADD modeling. Conduct Utility Coordination activities with utility owners.
- Provide a Professional Engineers (PE) Stamp from Colorado to certify designs and/or changes to designs.

Training & Blended Team Project Delivery:

- Perform, review, train, and provide technical support on various travel demand and traffic operation models, including but not limited to, VISSIM, CORSIM, SYNCHRO, TruTraffic (formerly TSPP-Draft), HCS/FreeVAL, and TransModeler.



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- Train CDOT personnel on use of specialized traffic, transportation engineering, and telecommunications/network related software in addition to any training requested.
- Provide and conduct research on innovative ideas/implementations and demonstrate how they could be implemented at CDOT.
- Provide support to the Maintenance Training Manager to coordinate all training, including standardizing the training and development of maintenance employees across the state.
- Provide design support and/or construction plan and spec review as a blended CDOT and consultant team, delivering portions and/or providing training to traffic project managers/designers in the design of complex traffic projects, such as roundabouts, complex corridor reconstruction, etc.

Provide Construction Engineering Support as follows:

- Provide constructability reviews on plans and specifications prior to advertising.
- Construction management, inspection and completion of appropriate CDOT paperwork as required, including ITS construction and field management. Work assignments may be for any shift in the 24-hour day. Project site may be anywhere within Colorado.
- Oversee construction management, inspection, and completion of appropriate CDOT paperwork as required, including ITS construction and field management, and materials (LIMS) data entry. Prepare monthly estimates for approval.
- Perform construction traffic control management and coordination activities.
- Perform material testing in accordance with CDOT Field Materials & Construction Manuals.
- Prepare sample test and material documentation to CDOT Central or Region laboratory.
- Provide design support during construction to address changes to design elements due to constructability issues or plan errors.
- Prepare and review change orders for CDOT and local agency construction projects to ensure they are in accordance with CDOT standards and requirements.
- Perform construction traffic control management and coordination activities.
- Construction management of utility installations
- Collection of as-constructed utility data using CDOT adopted applications, software, rules, and guidelines.

Provide ITS Component Support as follows:

- Develop plans and specifications for CDOT ITS and telecommunications/network related projects or tasks. This includes, developing network, software and hardware design and procurement, fiber assignments, fiber design and all pertinent studies, reports, drawings, diagrams, specifications, and manuals both in hard and electronic formats.
- Corridor planning analysis for future fiber optic backbone implementations including determining future node points for ITS elements, number of fiber strands required for future implementations, and best practices to facilitate private/public partnerships to build the fiber backbone.
- Develop transportation specific software and source code where specific Intelligent Transportation System priority requirements are defined.



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- Assist CDOT in procuring ITS telecommunications/network related hardware, software and pertinent materials.

Provide Miscellaneous Traffic Engineering Support as follows:

- Perform Access Management/Control studies and analyses based on the State Highway Access Code, including but not limited to preparing traffic impact studies, public meeting presentations, and staff coordination with local agencies, as well as the review of major and minor traffic impact studies from developers and other consultants. Provide technical support for these activities as needed.
- Local Agency project plan review and structural review. Comments and recommendations as needed.
- Review, attend meetings and provide technical assistance on traffic impact studies, NEPA, 1601's, Interchange Access Request, Minor Interchange Modification Requests, Environmental Assessments and Environmental Impact Studies as requested.
- Provide technical assistance with traffic engineering and ITS issues as requested and create white paper write-ups.
- Attend meetings as instructed. Prepare visual aids for meetings as needed.
- Prepare letters of correspondence and meeting minutes.
- Train CDOT personnel on specialized traffic, transportation engineering and telecommunications/network related software in addition to any training requested.
- Provide expert testimony regarding traffic operations.
- Provide structural inspection and report of Traffic Signal poles and mast arms, ITS structures and sign structures.
- Provide data management and asset management support and/or development of centralized data repository for field and asset data.
- Provide accessible documents as required following CDOT accessibility requirements for all deliverables as required.