MODIFIED BY EI 93-013
EFFECTIVE 7/1/93

SUPERSEDED BY EI 96-027
EFFECTIVE 4/25/96

ENGINEERING INSTRUCTION

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

SUBJECT: NIGHT-TIME CONSTRUCTION POLICY

Subject Code: 7.30

Distribution: 30 Main Office 32 Regions 34 Special

Code: EI-91-04

Date: 02/19/91

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Supersedes: N/A

Night-Time Construction Policy

This EI formalizes the policies of the Department with respect to night-time construction activities. The Department has previously addressed proposals for night-time construction on a case-by-case basis, without formal evaluation criteria. The continuing shift of construction program emphasis from new construction to reconstruction and rehabilitation, and continuing increase of traffic volumes in urban and suburban areas, have resulted in increasing conflict between construction activities and the need to maintain traffic, with significant implications for construction costs, traffic congestion, and worker and public safety.

Typical of the objectives and potential benefits cited for night-time construction are:

For the Contractor

(1) Reduction of conflicts between construction operations and traffic, and
(2) reduction of risk of traffic accidents involving workers and/or equipment and the traveling public.

For the Traveling Public and The Community

(1) Reduction of day-time traffic congestion due to construction, and,
(2) reduction of the duration of congestion (or detours) resulting from accelerated completion.
(3) reduced adverse impact on commercial enterprises adjoining the construction.

Typical applications of specified night-time construction have been repaving of major urban freeways, replacement/repair of bridges, and downtown street construction. Historically, night-time construction has been assumed to be more expensive because of premium labor costs and lower productivity. However, in some circumstances, working in lower or no-traffic conditions has counter-balancing efficiencies, resulting in equal or reduced costs.

This EI establishes the minimum requirements which must be considered in order for night-time construction to be approved by the Regional Director. It applies to both "normal" and "emergency" situations. Many conditions may be identified which warrant use of this approach to construction. Local circumstances and attitudes will be an important factor in making a decision to use night-time construction. This EI provides guidance to designers and EICs on the appropriate factors to consider in evaluating proposals for night-time construction. These factors apply whether the question pertains to the duration of a project or for just one night; however, the decision may change depending upon the period and urgency of such activity. Regional Directors are responsible for the decision under any circumstances, but may delegate the decision under appropriate circumstances. An analysis and recommendation to the Regional Director should be prepared at a level of detail commensurate with the duration, urgency, risk, and potential sensitivity of the proposal in hand.

In general, night-time construction should be considered with great caution due to the significant trade-offs that may occur among competing objectives. A two-step analysis of proposals for night-time construction is suggested; first, a review of qualitative considerations to assess the feasibility of the proposal, and second, a quantitative review of potential costs and benefits in comparison to other schemes. There are five primary considerations to be addressed:

- safety,
- quality,
- community impacts,
- traffic benefits, and
- construction costs.

These factors apply whether it is being considered as:

(1) A requirement of the contract contained in the bid documents,
(2) a change proposed by the Department potentially resulting in an order-on-contract, or
(3) in responding to a contractor's request.

<u>DESIGN PHASE PROPOSALS</u>

Proposals during the design phases to require night-time construction in the bid documents will generally involve substantial analysis and evaluation simply because such a proposal would usually be made only when faced with significant problems. An outline of the suggested analyses follows, with commentary on particular topics and experiences.

I. Qualitative Analysis

A) Safety - Night-time construction should be undertaken with due consideration and appropriate mitigation of the inherent risk for motorists, construction workers and inspectors due to decreased visibility and increased potential for motorist fatigue and intoxication. On any project, it is generally necessary to have:

1. high quality M&PT specifically for night-time conditions (including provisions for pedestrians),
2. if feasible, total shutdown and reasonable detour, or if there is no reasonable detour, work behind barriers in traffic,
3. adequate support and cooperation from public safety, police, and transportation agencies,
4. adequate visibility for workers and inspectors to safely perform their tasks and to be seen by others,
5. relatively low-risk work.

B) Quality - Night-time construction should be undertaken only with adequate lighting to enable the contractor to provide high quality work and with adequate visibility for the inspector to verify such quality. Night-time temperatures may preclude asphalt paving and other operations, although it may be advantageous for PCC paving during a heat wave. Extended duration of night-time work may affect workers' productivity and quality of work. On any project, it is generally necessary to have:

1. adequate visibility,
2. acceptable temperature,
3. minimum duration of night-time work.

C) Community Impact - Local ordinances, environmental conditions and attitudes will determine the relative importance of noise from construction operations, glare from high intensity lighting, the inconvenience of traffic detours and interference with access. On any project, it is generally necessary to have:

1. compliance with State and local ordinances,

2. advance publicity and coordination via hearings, EIS, agency meetings,

3. appropriate mitigation of noise and glare impacts, etc.,

4. ongoing public information effort re: TSM, etc.

II. Quantitative Analysis

A) Traffic Benefits - "Severe and extended congestion" is determined by local norms. Acceptable LOS and impact is not the same among urban/rural, upstate/downstate areas. For infrastructure projects on high volume facilities, the identification and analysis of motorist delay and safety costs based upon construction strategy may be more important than traditional life-of-the-project benefits typically analyzed for new facility or capacity projects. A suggested rule-of-thumb is that night-time construction may be warranted if there is a projected decrease of two levels of service (or F) during day-time construction in the peak hour. For projects expected to have such a low LOS during construction, significant benefit should be shown under a proposed scheme. For projects with high mileage detours, or high volumes and low LOS on local detours, or significant off site community impacts, significant benefit should be shown under a proposed scheme. Additional information is available from the Regional Planning Office and the M.O. Project Development Bureau on this topic.

B) Construction Costs - Premium costs for labor are an obvious consideration. Depending upon the nature of the work, individual productivity may decrease, but overall efficiency may increase due to avoidance of heavy traffic. Lighting will be an additional cost; M&PT may cost more or less at night depending upon circumstances. Expenses for supervision and inspection will generally be higher; extended duration of night-time construction is likely to require a consultant for inspection, due to inadequate premium compensation for Department staff. On the plus side, cost may decrease due to increased overall efficiency and shortened project duration.

In general, reasonable direct cost tradeoffs must be shown among potential minuses (labor premium and productivity, materials availability and handling, lighting, M&PT, inspection) and potential pluses (shortened duration, more efficient construction operations in off-peak traffic conditions). Indirect cost/benefits such as traffic impacts must be analyzed separately because they are not a contract cost.

CONSTRUCTION PHASE PROPOSALS

Proposals during the construction phase (by the Department or by the contractor) will generally require less analysis and evaluation, but should consider all of the same factors as described above at an appropriate level of detail for the duration, urgency, risk and potential sensitivity of the proposal in hand.

In principle, the contractor has the flexibility (within any constraints imposed by the contract, its specifications, and applicable local/State laws) to undertake night-time construction if it is of economic or other benefit to the firm. Regional Directors have the responsibility and right to place limitations on that flexibility in the public interest. Section 619 of the specifications will be revised to make that relationship explicit. In particular, EICs must evaluate a contractor's proposal for night-time work in accordance with this policy, especially concerning maintenance and protection of traffic. Accordingly, the Regional group managers should ordinarily be given the opportunity to review such proposals (in non-emergency situations).