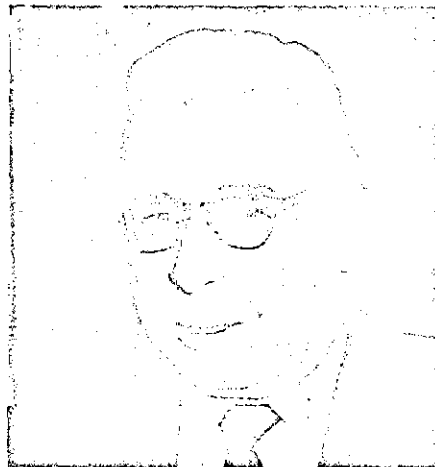


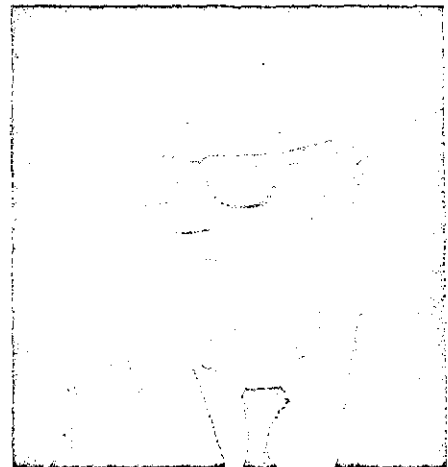
AASHO'S JOHNSON

Give us the money and we'll do the job.



BPR'S TURNER

Congress should let us finish on time.



REP. KLUCZYNSKI

There'll be no new road taxes this year.

## Stretchout Distresses Road Men

Highway officials, contractors and engineers harmonized in dismay last week at the prospect of stretching out the time required to complete the Interstate highway network. Only the money is in question, they agreed, and Congress ought to put it up.

Their forum was the national highway conference, sponsored by the Associated General Contractors of America, in Washington, D. C.

State highway departments and contractors can do the job on schedule, said A. E. Johnson, executive secretary of the American Association of State Highway Officials. "The money is the controlling factor," he said.

"There is an imminent possibility of a two-year stretchout" beyond the originally scheduled completion date of 1972, Mr. Johnson said. He reminded the audience that delay adds to the cost. Even without a delay the estimated federal share of the cost has already gone up \$5 billion and could go up another billion, he said, because of rising prices, the proposed highway beautification program and changes in design criteria.

Both Mr. Johnson and Frank C. Turner, chief engineer of the Bureau of Public Roads, pointed out that delays would postpone not only the traveling convenience on the Interstate system but also the economic development benefits and reduction in accidents that accompany completion of its various segments.

Mr. Turner said the program should be done the way Congress intended when it set up the program in 1956. Congress said the time period was basic

and that the necessary money would be provided, he recalled.

F. D. Lyons, Oklahoma's highway director, hit a fundamental, if muted, keynote to the construction industry's misgivings. If a two-year stretchout takes place, he said, "contractors in some states will have nothing to bid on in 1971, 1972 and 1973."

A key congressional leader, Rep. John C. Kluczynski (D., Ill.), chairman of the House subcommittee on roads, made it clear that Congress will not provide additional highway revenues this year. However, it will approve a \$3-billion continuation of the Interstate program for one year (fiscal 1967). BPR expects to apportion these funds to the states by August 15.

Conferees also exchanged ideas on the after-1972 needs study, under way and now authorized in the House version of the resolution that gives authority for apportionment of fiscal 1967 Interstate funds. They discussed highway beauty (they favor beauty, but do not want to spend construction funds to get it), and the relationships among highways and other forms of transportation. "A highway system in a major metropolitan area can not physically handle all the travel demands of the future," said Mr. Turner.

• **Smooth detours**—Contractors and engineers agreed that a joint effort is needed to improve methods for handling traffic through and around construction sites.

"We must be sure that the motorist is provided with the best possible facilities during the construction phases of

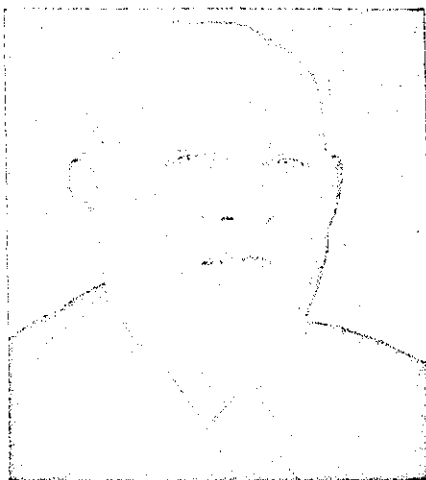
each project," said Charles E. Shumate, chief engineer of the Colorado Department of Highways. "We in the engineering phase of this program have a serious responsibility in this regard, one which I feel we have not administered properly in the past.

"The basic design must include provisions for the proper handling of traffic during the construction period. And there is no place left in the highway system for the unpaved detour."

Robert W. Sweet, chief engineer of New York State's Department of Public Works, said, "The problem of getting through and around a construction job lies mainly with the design engineer. And all concerned should do all possible to shorten the time required to do a construction project, which is nothing but a nuisance until it is finished and opened to traffic."

• **Fork in the road**—Unity of views at the conference ended when the subject of contract clauses came up. Highway contractors hammered away at state highway engineers and officials, trying to persuade them to incorporate two key clauses in the general conditions sections of their specifications. The two are a "changed-conditions clause" and a clause requiring "substantial compliance with specifications," rather than exact compliance. Their efforts met with varying success.

Only 10 of the 50 state highway departments now have a changed-conditions clause in their specifications. This contrasts with the universal practice of including such a clause in construction contracts awarded by federal agencies,



COLORADO'S SHUMATE

There's no place for an unpaved detour.

such as the Corps of Engineers and the Bureau of Public Roads (where it is the contracting agency).

Contractors such as William E. Naumann, chairman of the board of M. M. Sundt Co., Tucson, Ariz.; Nello L. Teer, Jr., of Durham, N. C.; and A. A. Benintend of the Gacon Construction Co., of Pittsburgh, favor strongly the use of such a clause in highway contracts.

Their basic contention is that the clause helps to minimize uncertainties in bidding, and therefore produces lower bid prices. "The changed-conditions clause will not protect a contractor against sloppy and imprudent site and job examination, but it does protect him against the unknown and the unforeseen, if the unforeseen was also beyond the knowledge of the awarding authority," said Mr. Naumann.

"Such a clause creates a joint respon-



CONTRACTOR MAXWELL

We are stymied by old-fashioned specs.

sibility between the owner and the builder for handling the unexpected," said Mr. Teer.

The clause drew strong support from Howard E. Hill, director of the Michigan State Highway Department, which includes such a clause in its specifications. "The clause is important primarily because it gives both parties a basis for negotiation," said Mr. Hill.

Harry E. Cunningham, western counsel for the Bureau of Public Roads, said, "The changed-conditions clause gives latitude to the owner to adjust to a changed situation."

Forrest Cooper, Oregon state highway engineer, dissented sharply. "There is ample machinery under the law to protect the contractor, regardless of the wording of the contract," he said. "We're building up a straw man—getting wonderful answers to a problem that doesn't necessarily exist."

Points of view on substantial compliance with specifications did not seem as clear cut as on changed conditions.

Contractor Walter F. Maxwell of Fontana, Calif., urged the states to include this clause in their general provisions, also. "It is our intent to build highways at the most economical cost. We cannot do this if we are stymied by old-fashioned specifications that require perfect conformance without reasonable and proper tolerances."

Under the substantial-compliance clause, an engineer in the field could, for example, approve a small area of subbase that approached, but did not meet, the compaction specification on the basis of his own engineering decision that its acceptance would not endanger the pavement structure. Contractors, then, would not have to compact most of the subbase to a density higher than specified merely to account for normal soil variations that make it impossible to compact to an absolutely uniform density.

A substantial-compliance clause that has drawn wide support is included in the AASHTO guide specifications on construction (Section 105.03). A number of states have incorporated this clause in their new specifications, and others are in the process of doing so.

Engineers who support its inclusion in their contract documents believe that it provides them with a legal basis for requiring only substantial compliance from the contractor, a practice they have generally followed for years anyway. The clause makes their lives easier when trying to justify minor deviations from the specifications to auditors and attorneys who want to insist on the letter of the specifications and not the intent.

## Computers Speed Expressway Traffic

Detroit and Chicago recently took steps to put heavily traveled expressway sections under computer control on a test basis. On a 3.2-mile stretch of Detroit's John C. Lodge Expressway, electronic controls will take over a system that has accommodated a flow of up to 10,300 vehicles per hour in three lanes. In Chicago, computers speed traffic on 7 miles of the Eisenhower Expressway's three westbound lanes.

Detroit's installation includes surveillance by television and ultrasonic sensors that have been in operation for over three years (ENR May 10, 1962, p. 26). The television cameras show monitors the cause of slowdowns or stoppages, while the overhead sensors measure the actual speed, concentration and size of vehicles passing.

On the basis of the electronic intelligence, human controllers change speed signs and temporarily close lanes. In

case of a prolonged tie-up, they may also close access ramps from the central control center. The computer is taking over these functions.

Traffic movement information will feed right into the computer, and operators will set in weather and pavement conditions plus, initially, speed and lane controls.

Traffic engineers expect that the operation will determine patterns of driver behavior so they can program the computer to take over the expressway signal system in about six months.

The controllers have already pushed rush hour operation from 6,000 to 10,300 vehicles per hour in one direction. According to the flow, they post speeds of 55, 40 or 25 mph.

On the Chicago project, electronic control has increased the speed but not the rate of flow appreciably. Sonic devices feed to the computer center the

speed and flow rate of vehicles. Computers control access to the expressway, closing ramps when there is congestion or an accident. The system has increased average speed from 25 to 35 mph, but raised the capacity only from 5,900 to 6,000 cars per hour.

Michigan, Detroit, Wayne County, the Bureau of Public Roads and 13 other states cooperated in developing and financing the Lodge Expressway project. The Eisenhower Expressway installation is a joint effort by Illinois, Chicago, Cook County and BPR.

ENR Index of Editorial Content\* for January-June 1965 has just been mailed to those on the index mailing list. The Index is free. If you wish your name added, please write to: Indexing Dept., Engineering News-Record, 330 West 42nd St., New York, N. Y. 10036.