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VMS and HAR Message Project: Improving the Hiring, Retention, and Development of New Jersey Department of Transportation Traffic Operations Center Staff

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HERE'S THE PROBLEM…

New Jersey Department of Transportation (NJDOT) Traffic Operations Centers (TOCs) serve a vital role in maximizing mobility of travelers throughout New Jersey and the entire Northeast Corridor. Having a competent, qualified, and motivated TOC workforce is therefore essential if these centers are to continue to be successful in the future. Similar to agencies operating TOCs in other parts of the country, though, the NJDOT has experienced some difficulties in continuing to meet the staffing needs of its centers. The functions and tasks typically performed in a TOC require staff with knowledge, skills, and abilities outside the range of existing employee title structures, position descriptions, and salary levels available within the Department. At the same time, the continuous (or nearly so) operation of a TOC means that staff are typically faced with non-standard and varying shift schedules, periods of intense work activity during major incident conditions and such, as well as periods of fairly light work that can potentially result in periods of operator boredom. Consequently, there was a significant need to assess and recommend ways that NJDOT and other agencies that operate TOCs could improve their hiring successes and better maintain adequate levels of staffing with the required knowledge, skills, and abilities for its TOCs.

HERE'S WHAT WAS DONE…

Researchers first conducted a telephone survey of TOC managers and supervisors in several other states to gather input about current issues in hiring and retaining quality staff in their TOCs and steps those agencies have taken to address those issues. The interviews were also structured to gather data regarding TOC operator pay scales and how it compares to other job titles with similar salaries, methods of evaluating operator performance, necessary qualifications and skills (and methods of assessing those skills).

Next, researchers extracted the desirable knowledge, skills, and abilities (KSAs) for NJDOT TOC operators from a previously-published federal document and tailored these KSAs to the specific functions and operator tasks that the NJDOT identified as essential for its TOC operators. These KSAs were then compared against the existing NJDOT position descriptions for Engineering Technicians 1 through 5, the positions from which operator personnel are currently obtained. New KSAs for the TOC operators were then developed for use during hiring and advancement activities.

Finally, researchers critiqued available training opportunities from the National Highway Institute (NHI), Center for ITS Training and Education (CITE), and New Jersey Department of Personnel (NJDOP) that are likely to help operators advance in their careers and become more effective at their jobs within the TOC.

HERE'S WHAT'S RECOMMENDED…

TOC Position Descriptions

New positions should be established specifically for traffic operations center operators in New Jersey. Recommended KSAs for entry-level and fully-trained TOC operators to be developed into NJDOT position descriptions by the NJDOT Human Resources and New Jersey Department of Personnel (NJDOP) are presented in the technical reports. For example, the desired knowledge of an entry-level and fully-trained NJDOT TOC operator is shown below.

DESIRED ENTRY-LEVEL KNOWLEDGE FOR NJDOT TOC OPERATORS

- Knowledge of standard computer workstation operations in Microsoft Windows-type applications environment.
- Knowledge of operation of hold, transfer, speak, listen, speed dial, and other standard business telephone headset features.
- Knowledge of numeric and text data entry and standard editing procedures using a computer keyboard and/or mouse.
- Knowledge of what a computer operating system, a software application, and a data base represents.
- Knowledge on how to use highway maps, video image displays, graphical and text data, and transportation icons to identify physical locations in the covered areas of the system.
- Knowledge of appropriate language and interpersonal communication (listening and speaking) used to conduct commonly used, business-related oral communications.
- Knowledge of local political jurisdictions and institutional relationships.
- Knowledge of key traffic origins and destinations in the covered areas, knowledge of the roadway network and travel conditions by time of day.

ADDITIONAL KNOWLEDGE DESIRED FOR FULLY-TRAINED NJDOT TOC OPERATORS

- Knowledge of operation of channeled two- way radio headset with selectable frequencies.
- Knowledge of impact of adverse weather on transportation systems, including wind, precipitation, temperature extremes, and airborne particulates (smog, fog, smoke, etc.).
- Knowledge of closed-circuit television (CCTV) camera locations and orientation, pan/tilt/zoom camera controls, camera pre-sets, iris functions, and white balance.
- Knowledge of NJDOT public policy principles including customer service, regulation, enforcement, liability, accountability, responsibility, information dissemination, controlled conduct.
- Knowledge of traffic flow characteristics such as speed, velocity, volume, average speed, density, percent occupancy, demand, and capacity.
- Knowledge of roadway geometry and lane configuration, direction, coordinates, links, nodes, zones, sections, mileposts, station numbering.
- Knowledge of general traffic surveillance, control, and data acquisition (SCADA) alarm principles.
- Knowledge of agency radio call signs and protocols.
- Knowledge of traffic law and incident management policies for NJDOT and responders including police agencies.
- Understanding of general traffic signal operations concepts including cycle, split, offset, placement of detectors, signal coordination, timing plans, zones, master/slave concepts, saturation, transition cycles, capacity utilization and flow characteristics, and queuing.
- Understanding of what variable speed limits, lane closures, ramp closures, and/or road closures for highways, tunnels, and bridges are meant to accomplish.
- Knowledge of incident response plan generation and traffic management procedures.
- Knowledge of the incident command system used in areas covered by the NJDOT TOCs.

Researchers also identified many available training courses that would help TOC operators become more effective in their roles. These courses cover both technical and interpersonal aspects of TOC operations, and include basic traffic engineering courses, incident and emergency management, traffic flow theory, signal time concepts, problem solving, and communication skills. A new training program on variable message sign message design and display was developed in another part of this project, and has been shown to be particularly effective in training TOC operators in proper design and operation of variable message signs under operator control.

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A final report is available online at
http://www.state.nj.us/transportation/refdata/research/

If you would like a copy of the full report, please call the NJDOT, Bureau of Research at (609) 530-5637 or send an e-mail to Research.Bureau@dot.state.nj.us and ask for:

Improving the Hiring, Retention, and Development of New Jersey Department of Transportation Traffic Operations Center Staff
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Improving the Hiring, Retention, and Development of New Jersey Department of Transportation Traffic Operations Center Staff: Executive Summary
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