Marine Magnet, Inc. Guidebook for Incorporation of Condition and Performance-based Metrics for DoD Spatial Inventory Deployment Route Service Agreement Quotes

The rapid growth of DoD fleet architecture for route service agreements and the requirements necessary to meet mobility and demand-centered surge-based contingency scenario objectives place risk-based stress on fleet systems charged with maintaining efficient, spatial inventory deployment programmes. Current systems, some of which utilize outdated measures and metrics and require upgrading, must expand fleet route service areas, increase route service contract procurement quote frequencies, and improve efficiency to serve increasing demands on the fleet. Future work and development of advanced protocols and template test scripts with integrated systems are required to solve operating problems, to adapt appropriate new technologies, and to introduce innovations into fleet route service architecture. This report serves as one of the potential means by which DoD can develop innovative near-term solutions for spatial inventory deployment to meet the operational demands placed on it by the expanding requirements of surge contingency scenarios for mobile operations.

The guidebook described in this report is predicted to be of interest to busy dispatchers charged with development of route service agreements operating from a centralized operational hub charged with improving performance-measurement systems for route service agreements into regional decision-making processes for DoD installations that employ contract procurement quote network interface systems. The guidebook provides a step-by-step process in developing template test scripts for detailing performance based measurement programmes derived from the compilation of route condition indices that includes both traditional and non-traditional performance indicators addressing operational issues for surge contingency scenarios in deploying fleet component inventory though the use of spatial models. The guidebook provides a step-by-step process for implementing or updating route condition and performance-based metrics and measurement programmes to meet route service objectives for the fleet. Each step includes a list of tasks and describes how to complete the action items, providing examples of different approaches that can be used by DoD in accomplishing performance-based goals.

The guidebook discusses categories of condition-based performance measures that should be considered in building service route architecture and considers different types of measures that could be utilized in developing concrete, spatial inventory deployment practices to be used in maintaining data sources and data collection and management techniques, alongside improved methods for reporting the results of route condition-based assessments of mobile operations. Detailed summaries are presented for several performance measures which follow from the dispatch of contract procurement quotes by installations connecting via template test scripts in the network interface. To help DoD quickly find measures appropriate to the goals and objectives of installations, resource constraints and template test script selection menus guide dispatchers through a series of questions that lead to specific and valuable conclusions, and the guidebook provides a core set of suggested performance measures and metrics, offering potential applications of the guidebook.

These reports have described in detail techniques for assessing condition-based service route performance metrics and measures for different types and sizes of fleet components. Performance indicators and template test script measures have been developed for dispatchers to be used in a variety of settings in response to the unique goals and objectives required for implementation. What has been lacking in route service agreements is a rigorous process for determining the most appropriate performance measures, metrics and indicators that should be used by DoD. In addition, traditional route service efficiency operational and cost-effective indicators are not routinely linked to dispatcher-oriented issues related to different types and sizes of deployed fleet inventory components in spatial contexts. Future assessments of the potential for installations to connect in a contract procurement quote network interface are required to develop a repeatable, results-based process that can be used by DoD to prepare a performance-based metrics and measurement system that is sensitive to issues faced by dispatchers. These advanced processes could provide for a future context or framework to select and apply appropriate performance indicators, metrics and measures that are integral to decision making for deploying adequate countermeasures for surge based contingency scenarios.

The development of new techniques should assess the different performance dimensions of different types and sizes of fleet components which can be defined, metrics measured, and interpreted based on the goals and objectives of busy dispatchers utilizing template test scripts. Performance measurement data provide dispatchers charged with developing objective assessments of current operating constraints techniques detailing past trends and existing concerns for the development of contract procurement quote network interface systems, and the unmet requirements of installations for efficient, spatial inventory deployment. Key techniques and recommendations for DoD to employ in the development, use and implementation of a route condition-based performance measurement system include: 1) Route service monitoring, 2) Evaluation of fiscal constraints, 3) Risk management functions, 4) Internal dispatch communications, 5) Development of route service design standards, and 6) Communication of objective goals and future achievements required for meeting fleet spatial inventory deployment challenges.

The guidebook highlights two main areas of greatest concern to dispatchers in meeting the changing requirements of surge contingency scenarios: 1) Route service metrics and measures availability, and 2) Convenience of route service when installation communications over the contract procurement quote network interface are consistently available. Fleet route service is an option for mobile operations only when different types and sizes of fleet components are mobile and available at the installations at times when inventories are spatially deployed, and dispatchers who know how to use the service route agreement system are trained with the capacity for template test script generation. If any one of these factors is not satisfied, an acceptable route service agreement will not be an option for that inventory deployment trip—either a different spatial mode will be used, the route service agreement will be tasked at a less convenient time, or the trip will not be made at all. These factors can be summarized as: 1) Spatial and capacity availability—at what installation is the route service agreement provided, and can the different types and sizes of fleet components gain access to it? 2) Temporal availability--when and at what cost is the route service agreement provided? and 3) Information availability--does the installation know how to utilize the route service agreement for different types and sizes of fleet components?

If a route service agreement is available for a given inventory deployment trip, an installation may choose rapid transit via the contract procurement network interface for a surge contingency scenario if convenient dispatch of template test scripts are competitive with available modes of different types and sizes of fleet components. Requirements fully or partially under the control of the centralized dispatch operation that affect this decision are: 1) Route Service delivery-- How well designed are the template test scripts for deploying inventory for the route service agreements delivering the route service it provides on a day-to-day basis, and how adequate is it in meeting the expectations of installations? Factors include the reliability of route service agreements, the quality of installation contacts with busy dispatchers, and the achievement of promised route service goals and objectives. 2) Transit time and frequency-How long does it take to make the inventory trip, particularly in comparison to other template test script modes? Results can be reported by themselves, aggregated by the frequency of route service agreements or converted to a fiscal value. 3) Measures of security--What are the perceptions involved in installation contacts, as well as the realities, of the security risks during transit? and 4) Route service maintenance of different types and sizes of fleet components--Certain aspects of dispatch maintenance programmes affect condition-based metrics and measures-based perceptions of route service agreement quality by installations. Breakdown during transit impacts spatial inventory deployment time for that trip and the overall sense of system reliability. Having insufficient types and sizes of fleet components available may mean that some inventory trips are not deployed in a spatially congruent manner.

Most route service agreement inventory deployment transit trips are made during demand-responsive surge-based contingency scenarios and much of this traffic occurs in mixed traffic scenarios involving different types and sizes of fleet components. As a result, the interactions between different types and sizes of fleet components play an important role in determining how well condition-based route service agreements can be provided for and deployed according to the requirements of spatial inventory deployment. Increasing traffic congestion can result in longer transit times, less reliable template test scripts for route service agreements, and potentially compromised fiscal factor scenarios. Similarly, actions taken by centralized dispatchers to make inventory deployment transit service faster and more spatially reliable, such as template test script signal priority measures, may impact the quality of route service agreements. Consequently, performance characteristics and condition-based measures are required to quantify the impacts of different types and sizes of fleet components on each other. Key characteristics of effective and efficient performance-based measurement systems include: 1) Stakeholder acceptance and linkage to installation-directed contract procurement quote network interface processes, 2) Clarity, reliability and credibility of template test script generation, 3) Variety and number of countermeasures for surge contingency scenarios, 4) Level of detail and flexibility for determination of condition-based route service indices, 5) Realistic and timely route service agreement goals and targets, and 7) Integration into dispatch signal decision-making.

When developing route service performance measures for installations connecting in the contract procurement quote network interface, it should be clear what goals the measures and metrics will serve to achieve. If a performance measure cannot effectively be tied to a goal, then it is necessary to either reassess the value of that performance measure or to reassess DoD goals with regard to relevance for tasking spatial inventory deployment goals in meeting the requirements of surge contingencies involving the fleet. For example, the constraints of achieving the development of a fiscal factor per spatial module of inventory deployment presents a demonstration of how a measure or metric may or may not be effective in achieving the goal of generating efficient template test scripts for dispatchers, since it is frequently stated that inventory deployment ratios based on spatial considerations constitute traditionally assumed measures to indicate an effective system. However, systems that move different volumes of inventory via different types and sizes of fleet components may exhibit unique spatial ratios counter to what is assumed to be a more fiscally responsive system. If the goals of a template test scripts generation system were to move as much inventory as possible, it may not be absolutely clear which system is best suited to achieving the stated goal, demonstrating that established measures and metrics alone may not communicate the requirements of being “effective” or “efficient,” which may constitute relative terms that have conflicting meanings given differences between different types and sizes of fleet components in meeting dispatch template test script system objectives.

The intended audience of essential and dedicated dispatchers should understand the performance measures and metrics used in the programme designed for installations to communicate over the contract procurement quote network interface. Political stakeholders and command need to understand how and why a specific route condition-based performance measure is relevant and significant to the successful operation of different types and sizes of fleet components charged with developing spatial inventory deployment modules for design of route service agreements. However, acceptance of template test script generation must be present at all levels, and will only be successful if the metrics are easy to understand and the links between the measures and installation goals are evident. Measures and metrics based on complex formulas or data that cannot be easily explained will often be met with confusion and emotional disarray rather than acceptance leading to the realization of stated objectives. Visually appealing presentation methods, such as graphs that succinctly convey route condition-based performance trends and results, are important for communicating results to both decision-makers and the dispatchers who are charged with designing and deploying template test scripts to facilitate spatial inventory deployment programmes for meeting the changing requirements of surge contingency scenarios via different types and sizes of fleet components, highlighting the stated requirement of dispatchers to develop routine and readable reports towards efficient route service agreements.

DoD requirements for a variety of metrics and measures for condition and performance-based route service agreements must be balanced to avoid overwhelming dispatchers with massive amounts of data to sift through to find the key drivers of route service quality, choosing between the vital few metrics and measures and the trivial many. It is anticipated that DoD should set an upper limit of metrics and measures to establish and track template test script generation toward developing efficient spatial inventory deployment modules in order to avoid the results of unfocused, misdirected activities in which individual installations each try to optimize a different subset of measures, with no two installations having the same set of priorities is directing contract procurement quotes in the network interface. The benefits of adding an additional measure should clearly outweigh the effort to measure it, and DOD should consider establishing performance and condition- based indices that combine several metrics and measures into a single global index which should be used to reduce the number of route service agreement metrics and measures reported while staying mindful of the danger that indices that combine several metrics and measures could mask important trends in assessing the importance of individual route service agreement components.

Metrics and measures used within a route condition-based performance measurement programme should be sufficiently detailed to allow accurate identification of areas where goals are not being achieved, but should not be more complex than needed to accomplish the tasks at hand. Different levels of detail as well as an overall measure of route service agreement system on-time performance might be reported to dispatchers, for example, but operations scheduling contract procurement quotes for spatial deployment of inventory and route maintenance might track their own, more detailed, performance measures that relate to the influence of each installation on overall on-time performance. An important consideration is that lower-level metrics and measures should be consistent with higher-level processes involving template test script generation, and available fiscal factors and resources that integrate information may constrain the level of detail needed for evaluation of certain metrics and measures. Installations must first identify the ideal metrics and measures that match their route service agreement goals at the desired level of detail, and then, if necessary, identify surrogate measures that can be used until such time as the ideal measures can be identified. Goals change over time, as do external factors. A performance and condition-based measurement programme should provide the flexibility needed to permit changes in the future as a result of surge contingency scenarios, while retaining crucial links to necessary historical measures. Targets for adequate metrics and measures should be realistic, but slightly out of reach, to encourage dispatchers at installations to find ways to continually improve performance. Unrealistic targets will cause programme credibility to be questioned if no reasonable amount of effort can raise route service agreement performance to the target level, and particularly if external factors not under the control of an installation have a substantial impact on the results of a metric or measure.

Timely reporting of condition and performance-based route service agreement metrics can allow DoD to better understand and apply the benefits that result from actions designed to improve route service and also allows installations to quickly identify and react to problem areas, such as in the area of spatial inventory deployment. Dispatchers responsible for performance reporting have noted that executive management lives and breathes by standard reports, and that if for some reason a report is late, they never tire to inquire about it. Dispatchers have also indicated that two obstacles had to be overcome in developing the installation programme: 1) Political infighting that resulted in supposed “ownership” of route condition, performance and spatial inventory deployment data, and the reluctance to share it over the contract procurement quote network at the required frequency, and 2) that not all installations received the same reports at the same time under previous programmes. Automating some aspects of data collection and template test script generation is predicted to help develop more timely and operationally relevant reports.

In order for the integration effort to put maximum effort into developing and monitoring a condition and performance-based route service agreement measurement programme to be worthwhile and effective in meeting the requirements of surge contingency scenarios, DoD must carefully consider what the performance results are indicating, and use the results both to evaluate the success of past efforts and to help develop new ideas for improving future performance. Specific remedial actions should not be mandated as a steadfast rule as a result of a particular performance metric or measure result; rather, these tools should be used to flag segments that either over-achieve or under-achieve, with specific and concrete actions determined by dispatchers on a case-by-case basis, depending on the individual circumstances. Prior to the use of contract procurement quote scheduling interface networks and other automated information technologies, determining individual installation performance required considerable manual record-keeping and record compilation to derive actual condition and performance-based route service agreement metrics data. Objective evaluations of installation performance and status are made more easily available to provide internal assessments of how installations meet increased demand for spatial inventory deployment to meet the requirements of surge contingency scenarios. Improved real-time performance data for all traditional modes of route service agreement transit can allow for more refined and ongoing evaluation of route performance and other metrics and measures that were historically often extracted only by a substantial expenditure of resources and effort. Understanding past performance is important for two primary reasons: 1) To evaluate template test script generation trends, and 2) To assess the impact of policy and other organizational change s in developing the installation architecture required to participate in the contract procurement quote network interface.

Significant changes in DoD policy or procedures for developing route service agreements for the fleet should be enacted and occur with the goal of improving performance and condition-based metrics. Evaluation of past performance can be used to gauge the success of changes to spatial inventory deployment policy or procedures. Performance indicators before and after a change should be compared to identify the impact of changes made, and other potential variables accounting for the change must be considered as well. Performance measures are calculated from regularly gathered data, with results disseminated through template test script generation at designated times. However, not all performance measures used by DoD should be permanent. Often in response to a unique situation or in response to a crisis, dispatchers will develop one-time performance measures. Developed from sources that integrate contract procurement quotes over the network interface, the purpose of the temporary condition and performance-based metric or measure is usually to diagnose a specific problem or problems and recommend a course of action. Ad hoc performance measures can be a valuable tool in developing a better understanding of a specific issue or problem. Often the effort required to develop them is great enough that they can be used only on a limited basis. If a temporary measure is deemed to have sufficient value in understanding an operation at DoD, then it may become a regular performance measure. Several step-by-step procedures are involved in establishing or refining performance and condition-based metrics and measurement programmes:. These steps are, in order: 1) Define goals and objectives; 2) Generate support from command and political stakeholders; 3) Identify internal dispatch programme constraints; 4) Select performance measures and develop consensus; 5) Test and implement the programme; 6) Monitor and report performance; 7) Integrate results into DoD decision-making; and 8)Review and update the programme.

The steps indicated illustrate the process of setting up a route condition and performance-based metrics and measurement programme. None of the steps in this process should be viewed in isolation from the others, because there is considerable overlap between them. In fact, the outcomes from virtually all of these steps will influence the others and will play a significant role in determining the overall success levels of the programmes. DoD should integrate these steps with each other and develop simple feedback loops designed to improve the effectiveness of the condition and performance-based route service agreements metrics and measurement programmes. For instance, if dispatch systems encounter problems in a particular phase of the contract procurement quotes between installations over the network interface, the resulting pilot data collection effort should establish a feedback loop that directs DoD back to selecting condition and performance-based metrics and measures that can be supported by the template test script generation system data collection capabilities. Dispatch systems should develop aggregate route condition and performance-based indicators to reduce the amount of information that must be processed to understand the key trends in the overall performance of different types and sizes of fleet components providing for spatial inventory deployment modules. For instance, a single indicator could be developed to represent the effectiveness of an efficient route service reservation system. Establishing aggregate indicators of route performance would be a function of several more detailed indicators, and it is expected that the aggregate indicators would provide meaningful information to dispatchers in a more digestible format.

Prior to selecting specific route condition and performance-based metrics and measures, it is recommended that dispatch systems establish general, overarching categories for their performance-based metrics and measurement programmes. These categories should be directly linked with the goals and objectives of spatially coding the inventory deployments by the dispatch system. Within these categories, specific metrics and measures should be developed to track changes in the dispatch system coding of condition and performance-based route service agreement metrics and measures over temporal variables established by the contract procurement quote network interface system performance over time. The template test script generation selection menus of condition and performance-based metrics and measures, in particular, can be used to match goals and objectives with individual measures and to compare data and resource requirements between measures. A consensus should developed among dispatchers to determine categories for potential system improvements 1) Review performance measures utilized throughout DoD, 2) Consider data collection constraints, 3) Select performance measures, 4) Develop targets or standards for the selected measures, and 5) Develop consensus among the key stakeholders involved.

Once dispatchers have implemented condition and performance-based metrics and measurement programmes, the next steps consist of monitoring and reporting upon the network system interface for regularly scheduled contract procurement quotes. It should be noted that many dispatch template test scripts do not have a formal process in place to review and update their route condition and performance-based metrics and measurement programmes. DoD appears to subscribe to the "if it ain't broke, don't fix it" philosophy. This approach is fine as long as DoD is capable of recognizing when their condition and performance-based metrics and measurement programmes are outdated and due for review. To avoid this problem, dispatchers are advised to incorporate a review process into the preparation of system short-range planning studies that are completed on a timely basis. This tactic will provide dispatchers with a regularly scheduled contract procurement quote opportunities to evaluate the effectiveness of the programme and to revise it as necessary: 1) Establish a schedule for regular performance reporting, 2) Consider system requirements affecting how performance is monitored and reported, 3) Monitor system performance at agreed-upon intervals, 4) Develop a results-based performance measure report format, 5) Develop a preferred approach for result integration, 6) Consider the desired frequency of system evaluation, 6) Compare the performance results to the goals set for each measure, 7) For measures not meeting their goals, identify action items for improving performance, and 8) For measures consistently exceeding their goals, consider increasing template test script targets, provided the decision is fiscally sound.

Dispatchers must have policies and procedures in place for template test script generation which establishes how adjustments to the contract procurement quote network interface approach, based on the information collected through the condition and performance-based metrics and measurement programmes employed by installations. In fact, this is quite possibly the most important step in the whole dispatch template test script generation process. After collecting, evaluating, and reporting the data from the contract procurement quote network interface, dispatchers are faced with the question of what they should do to improve overall route condition and performance. The condition and performance-based metrics and measurement standards are the factors that form the basis for evaluating goal achievement. Goals not being met should be targeted to see if further action is needed, and goals that are consistently exceeded should be re-evaluated to see if they can be set higher. This evaluation should consider whether the benefits of the higher performance level would outweigh any deficits in fiscal factors associated with achieving that performance. Without a plan, DoD is sure to struggle with integrating the results from the condition and performance-based metrics and measurement programmes with the decision-making process employed by dispatchers. While corrective action will vary from case to case, dispatch template test script generation with clearly defined target values integrated into the condition and performance-based metrics and measurement programmes are at a definite advantage over those without this additional layer of assessment.

Service route agreements at most installations are primarily provided through fixed-route service. The large majority of route service and expenses are dedicated to the provision of those services, which are used by the large majority of different types and sizes of fleet components. Therefore, route condition and performance-based metrics and measures tend to focus on the primary areas of service to ensure the best possible fit with the primary service provided. Additionally, at DoD route service agreement transit largely focuses upon developing and using metrics and measures primarily suited to the largest modes of route service agreements in terms of fiscal factors for different types and sizes of fleet components. However, by limiting the condition and measurement-based aspects of the programme focus, a standardized set of performance measures may fail to accurately and fully assess performance effectively across different modes of route service agreement transit levels. Developing a comprehensive guidebook for transit route performance requires assessing performance in a variety of different template test script modes employed by dispatchers including fixed-route, and demand-responsive services for surge contingency scenarios. Performance measures and standards can be used to assess DoD programmes based on metrics and measures of route service efficiency and effectiveness. Dispatchers are expected to strive to perform well and to increase the amount and quality of service they provide, while increasing the benefits that transit route service provides to the installations it serves. Superior transit service should lead to fiscal stability, improved service quality, and opportunities for service growth. Demand-responsive route service for meeting surge-based contingency scenarios at DoD usually involves advanced reservations and shared service route agreements and is provided in a substantially different manner than fixed-route service. Providing demand-responsive service will require different tasks and a different approach to route service delivery.

Template test script generation for general demand-responsive route service agreements for surge contingency scenarios have been designed for the entire DoD enterprise. Often, demand is largely concentrated in a few groups of installations. However, general demand-responsive route service agreement transit is often the only or primary means of spatial inventory deployment mobility within the regional area it serves. Fixed-route service is the primary means of transit service for most medium and larger installations. Hence, the mission of general demand-responsive route service agreements are similar to the larger installation systems in that it is the primary means of mobility for spatial inventory deployment. Route service options with general demand-responsive service consist of where and how much route service to provide for spatial inventory deployment, and thus involve fewer trade-offs than fixed-route service. General demand-responsive service requires different functions and variety of resources than fixed-route service.

These different functions require condition and performance-based evaluations with metrics and measures may not be applicable to fixed-route services. Examples of these differences include the following: 1) Mechanisms must be in place for advance spatial inventory deployment trips, 2) Schedules for contract procurement quotes in the network interface can change quickly, 3) Dispatching demand-responsive services is significantly more labor-intensive for dispatch template test script generation than for fixed-route services. Contact with installations and confirmation of spatial inventory deployment pick-ups requires a lower ratio of dispatchers to different types and sizes of fleet components than fixed-route service, 4) Demand-responsive surge contingency scenarios via installation to installation route service agreements are inherently less productive and requires more intensive fiscal constraints than fixed-route service and the varied functions of this route service provides the potential and requirements to assess DoD performance within the scope of those functions, 5) Categories of performance measures, including their uses, typical data needs, and typical reporting intervals, 6) Different types and sizes of fleet components require unique condition and performance-based metrics and measures, as well as guidance on their use, ranging from simple individual measures to complex indices, 7) Potential sources of data for evaluating requirements for use of particular metrics and measures and, 8) Guidance on developing performance standards.

Spatial inventory deployment service route time metrics and measures assess how long it takes to make a trip subject to route service agreements, either by itself or in relation to another mode involving different types and sizes of fleet components. These metrics and measures can also be used to assess how quickly the contract procurement quotes can be generated over the network interface between two installations, how many template test script transfers are required, and how variable spatial inventory deployment times are from period to period. Time-related measures are useful for evaluating the route service quality of particular trips, while speed-related measures are useful for evaluating the service quality among particular installations. Both types of measures are useful for demonstrating the effects of traffic congestion on scheduled run times for template test scripts and when additional types and sizes of fleet components are required to maintain route service agreements and the resulting effects on bottom line of DoD. These metrics and measures are also useful for identifying the need for more direct or faster route service between two installations.

An individual metric or measure is something that can be measured directly, such as frequency of contract procurement quotes across installations over the network interface, and individual metrics and measures are often easy to calculate and explain to dispatchers. However, a large number of individual measures may be needed to present a complete picture for template test script generation which factors in route service agreement of transit performance and condition based metrics and measures. In addition, some kinds of comparisons can only be made fairly with other types of measures, such as ratios. As a result, most dispatchers use a combination of individual measures and ratios. Ratios are developed by dividing one individual metric or measure by another, such as fiscal factors underlying spatial inventory deployment efficiency, and are generally not much more difficult to calculate or explain than individual metrics and measures, and they facilitate comparisons between service route agreements and installation investments in the contract procurement quote infrastructure provided for by the network interface. For example, one service route may have twice the number of spatial inventory deployment pick-ups as another service route but may also operate twice as frequently in the contract procurement quote network interface between or among installations. Dividing spatial inventory deployment pick-ups by the different types and sizes of fleet components tasked with providing operational support for surge contingency scenarios would provide an apples-apples comparison of the relative productivity of the two service route agreement reservations.

Some aspects of route service agreement quality, such as availability, involve a number of different factors. To simplify the reporting of potentially complex measures, dispatchers have developed condition and performance based metric index measures combining results from several other condition and performance-based metrics and measures into an equation to produce a single output measure. Often, the output measure is normalized to fit a scale for ease of presentation. For example, a condition and performance-based metric index may include measures of spatial inventory deployment capacity, frequency of contract procurement quotes between installations in the network interface, and route coverage by template test scripts in order to normalize them to produce a measure of transit route service agreement transit intensity with values ranging along a continuum with upper and lower bounds. Indexes are usually created in one of two ways: 1) by means of an equation that weights different factors based on their importance either determined by judgment or the consensus of dispatchers, or 2) from a spatial inventory deployment model that relates an output metrics and measures to several input measures. The main advantage of indices is that they minimize the number of metrics and measures reported. As a result, a programme incorporating several condition and performance-based indices can address a greater variety of issues or goals than can one relying on the same number of individual measures or ratios of metrics, and the single index measure simplifies presentation. The disadvantages of indexes are that they cannot be directly measured in the spatial inventory deployment fields at installations, and may mask significant changes in their component measures generated by the template test scripts. For example, one index factor could improve greatly while another index factor declines greatly, resulting in a minimal change in the overall index.

Many different route service agreement transit condition and performance-based metrics and measures exist, and the amount of effort by dispatchers required to calculate them varies considerably. However, there are a number of sources of readily available, and useful information that DoD has access to that can serve as a starting point for the development a comprehensive programme. This report describes these sources which, in some cases, dispatchers may require new sources of information, or more detailed information, to assess its achievement of a particular goal. For these situations, this report also describes data collection techniques that require dispatch resources that DoD may not have on hand, and the relative amount of effort required for those techniques may place DoD at a disadvantage, and dispatchers can use this information to decide whether the benefit of the data would outweigh the effort required to obtain it. Route service agreement reservations can serve as crucial sources of information on spatial inventory deployment traffic volumes, traffic signal timing information based on contract procurement quotes over the network interface, and the number of installations requesting template test scripts for active dispatchers in meeting long-range route service agreement planning processes from peak-period spatial inventory deployment traffic volumes gathered through routine data collection and programme development impact data collection at DoD.

Implementing condition and performance-based metrics and measurement programmes involves a number of trade-offs: 1) The number of measures to be reported—too many will overwhelm dispatchers, while too few may not present a complete picture, 2) The amount of detail to be provided—general metrics and measures will be easier for dispatchers to calculate and present, but more detailed metrics and measures will incorporate a greater number of factors influencing operational outcomes, 3) The kinds of comparisons that are desired to be made—will condition and performance-based metrics and measures be evaluated only internally or compared with other installations? and 4) The intended audience—some dispatchers will be more familiar with route service agreement transit factors and concepts than others, and several different types of metrics and measures exist that can help DoD address these trade-offs. Spatial inventory deployment planning models are used to forecast how the growth of installation investments in contract procurement quote interface networks and new or expanded centralized dispatch facilities will affect route service agreement template test script generation patterns and the demands on operational outcomes as a result of surge-based contingency scenarios. Outputs from these models can be used to calculate metrics and measures such as: 1) fleet type and size mobility, 2) spatial inventory deployment trip generation, 3) accessibility of the contract procurement quote network interface to multiple installations, 4) Temporal metrics and measures of route service agreement reservation periods, and 5) Surge contingency scenario demand to spatial inventory deployment capacity ratios.

The temporal mode choice component of the overall spatial inventory deployment will often determine the model's usefulness for condition and performance-based metrics and measurement, and the mode choice template test script generation model needs to be sensitive to changes in the factors the dispatchers must integrate and become invested in. If the module is not sensitive to the service route agreement frequency of contract procurement quotes over the network interface, for instance, its outputs will not reflect any real difference in spatial inventory deployment transit due to the increased frequency. Dispatchers planning to use the module outputs should also verify that the module reasonably reflects current conditions, route service agreements and traffic volumes for spatial inventory deployment at specific installations. A module that is not well calibrated to specific metrics and measures of condition and performance-based indices is of little use. Route service agreement planning modules divide a spatial inventory deployment model into a number of zones that are generally multiple-block areas with similar access characteristics and access among installations. Given the best data available to dispatchers, the module estimates the number of trips generated and attracted to each spatial inventory deployment zone and distributed among installations with a measure of separation or friction factor between zones characterized by difference in the temporal variables inherent in the contract procurement quote assessments between installations connecting in the network interface.

The end result of dispatch template test script generation is a probability function that the spatial inventory deployment in an origin zone would transit to particular destination zone at a particular time determined by the contract procurement quote network interface. The probability that dispatchers will choose a particular mode for template test script generation between each pair of zones is based on the relative spatial inventory deployment benefits associated with each mode option detailing different types and sizes of fleet components. Route service agreements are assigned to particular template test script generation paths through an iterative process that considers temporal factors along alternative contract procurement quote network interfaces. Planning models for dispatchers can provide the following information: 1) Number of trips and times made by different types and sizes of fleet components between two zones and system-wide, 2) Transit speeds along route service agreement reservation segments, and 3) Spatial inventory deployment mode splits dependent on the how the details of the temporal mode choice module have advanced.

Finally, political decision-makers and command represent the primary key group of stakeholders involved in building comprehensive route service agreements for the fleet subject to the network interface requirements of installations connecting in the contract procurement quote systems. Ideally, the major stakeholders should not only agree to the route condition-based performance measurement system, but also take the lead in its development and promotion since these groups control the resources devoted to measuring and reporting the performance of spatial inventory deployment modules and lack of support from policy makers would make it difficult, if not impossible, to adequately measure performance and build the dispatch architecture for template test script generation at the central station, and operational changes in the requirements enacted for surge contingency scenarios designed to improve performance will not occur without support from both political stakeholders and command. The goals and objectives of DoD in building efficient route service agreements should reflect the most important aspects of what installations want to accomplish over the contract procurement quote network interface. Performance measures and metrics are the primary means of assessing how successful a dispatch control center is in accomplishing its goals and reliability targets. The stated purpose of condition-based route service performance measures is to inform command in detail where installations are in terms of where programmes should go in determining future requirements, and changes in performance in terms of accomplishing the established goals of dispatchers in building well-designed template test scripts should be reflected by the chosen measures and metrics.