

State of Vermont
VTrans Highway Division
Bridge Preservation and Preventive Maintenance 2020
Program

The VTrans Bridge Preservation and Preventive Maintenance Program utilizes a combination of federal and state funds to extend the life of bridges on the interstate and state highway network. The purpose of this guide is to provide an outline of the process and activities used to define the program as part of implementing an asset management approach to the bridge network

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I. Background and Objectives:

Background:

VTrans is responsible for the inspection and inventory of approximately 4,000 bridges on the interstate, state and town highway network in Vermont. This includes conducting maintenance and preservation activities for all bridges on the interstate and state network while municipalities are responsible for conducting maintenance and preservation activities for town highway bridges. Overall, VTrans is responsible for the maintenance and preservation of approximately 2,350 bridges on the interstate and state highway.

Objective:

The purpose of this document is to identify the process, decision-making framework and related documentation on how VTrans will implement a Bridge Preservation and Preventive Maintenance Program. The focus of this document is on addressing the identified preservation and maintenance needs of the interstate and state highway bridge networks; major bridge rehabilitation or replacement will be accomplished through the Capital Program. The implementation of this program will be responsibility of the VTrans Bridge Maintenance Working Group.

The Bridge Maintenance Vision:

To preserve, maintain, and operate this bridge maintenance program in conjunction with our transportation system in the most cost effective and efficient manner. To have and maintain a successful bridge maintenance program seeking a balanced approach to preservation and rehabilitation/replacement.

The Bridge Maintenance Mission:

As the bridge owner we will be more strategic by adopting and implementing systematic processes for bridge preservation and maintenance.

Goal:

Our Goal with this Mission is to provide the foundation and framework in this document for the Highway Division to establish, fund, and execute a Bridge Preservation and Preventive Maintenance Program with the following objective:

II. Definitions:

Condition-Based Maintenance Activities:

Condition-based maintenance activities are performed on bridge components or elements in response to known defects. Condition based maintenance improves the condition of that portion of the element, but may or may not result in an increase in the component condition rating.

Cyclical Maintenance Activity:

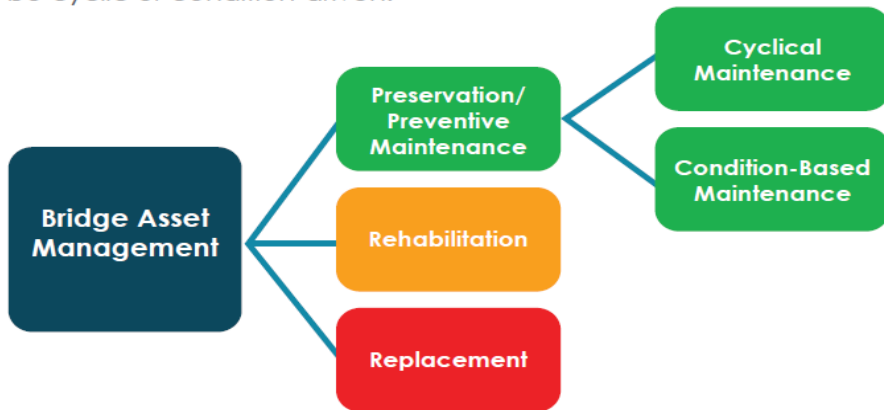
Cyclical maintenance activities are performed on pre-determined intervals that aim to preserve and delay deterioration of bridge elements or component conditions.

Preservation can be categorized under the list of cyclical maintenance activities and defined as the following:

- Prevent, delay, or reduce deterioration of bridges or bridge elements
- Restore the function of existing bridges
- Keep bridges in good or fair condition
- Extend the life of existing bridges

- Preservation actions may be cyclic or condition-driven

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III. Bridge Findings:

Bridge Findings are the mechanism to identify necessary work activities on bridges across the network. While these finding may be identified by different groups within VTrans or the travelling public, the primary method for identifying Bridge Findings will be through annual bridge inspections.

1. Condition Classifications:

As Bridge Findings are identified, the first step will be to assess the risk associated with the finding. Risk may be assigned based on a formal or informal assessment of the functional and operational condition of a bridge. Bridge findings are categorized into one of six different risk classifications (See Figure 1). Each bridge finding has a different expectation on when the proper activities need to be performed to keep the bridge safe and serviceable.

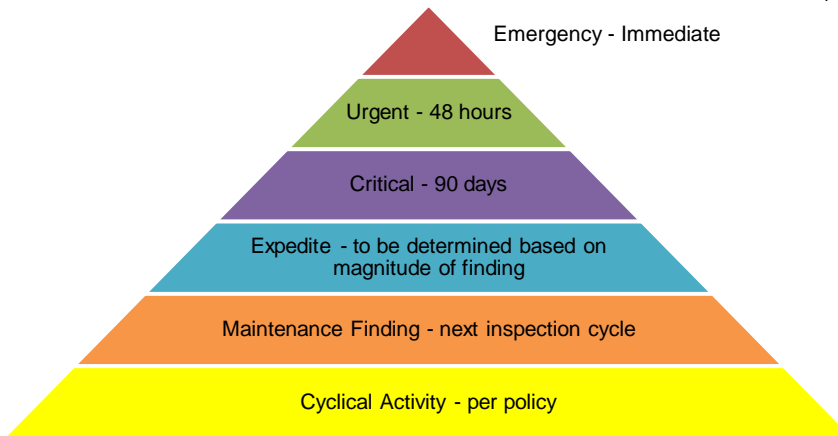


Figure 1: Bridge Finding Classification

In determining the bridge finding classification, the following criteria are to be used as a guide in determining the risks associated with the appropriate classification for each bridge finding;

- Stability – loss of competent bearing of bridge component.
- Structural Integrity – loss of structural section from deterioration or resulting from impact damage.
- Safety – damage or deterioration to bridge element that creates a safety hazard for the traveling public.

2. Descriptions of Finding Classifications:

Action taken in any of the categories below may be of a temporary nature until a more permanent repair can be performed;

- Emergency – conditions are unstable and the public is at risk; **immediate** action is required.
- Urgent – conditions result in a concern for, or threat to, public safety and action needs to be taken to address the problem within **48 hours** of notification.
- Critical – conditions which have a potential safety concern and need to be addressed within **90 days** of notification; systematic monitoring of conditions, noting for any changes, may be required in the interim.
- Expedite – conditions which have a potential safety concern and need to be addressed within an **expedited timeframe** (i.e. within a construction season) of notification; systematic monitoring of conditions, noting for any changes, may be required in the interim.

- Maintenance – conditions which are not a risk to, or directly impact, public safety but that have a negative effect on the structure and if left unattended would likely progress; creating the need for more extensive and costly repairs. These findings should be addressed **prior to the next scheduled bridge inspection.**
- Cyclical Preventive Maintenance – these are **cyclical** needs that are routinely performed as part of normal, everyday operations to keep the bridge in fair to good condition by preventing, delaying, or reducing deterioration.

3. Classification Process:

- a. **Emergency and Urgent Findings:** At the top of the pyramid in Figure 1 are the most serious bridge findings; emergency and urgent findings. These findings require immediate attention to ensure the safety of the traveling public and may come to VTrans' attention through multiple channels (public, bridge inspections, maintenance staff, etc.). The nature of these findings does not lend itself to having a hard and rigid process for implementing a treatment. However, the Agency must have notification and decision-making protocols for these types of findings.
1. These findings require immediate notification, findings should be reported to:
 - i. The appropriate Municipality, District Transportation Administrator (DTA), General Manager, and District Project Manager
 - ii. The AMB Bridge Inspection Unit – Bridge Inspection and Budget Program Manager and Bridge Inspection Manager / Team Leader
 - iii. Maintenance Bureau Bridge Maintenance Engineer
 2. The appropriate immediate response will be determined by these entities working together to assess and perform the appropriate response to ensure the immediate safety of the traveling public. Types of immediate response strategies may be, but are not limited to: bridge closure, lane restrictions or many forms of temporary measures (fill, patching, stabilization, etc.). Normal channels of notification to Agency management and the public will occur through AOT Road Closures, 511 updates and e-mails, as appropriate.
 3. Many times, this immediate response is only temporary and intended to address the immediate safety concern. Once the immediate repair has been identified, the State Bridge Maintenance Engineer will bring this finding to the VTrans Bridge Maintenance Working Group. This Bridge Maintenance Working Group will work together to classify the most appropriate, longer term solution to the issue.
- b. **Critical and Expedite Findings:** The middle two categories of the pyramid in Figure 1 are those findings that while serious in nature, are deemed to not have an immediate impact on the safety of the traveling public. These findings are also likely to come to VTrans' attention through multiple channels (traveling public,

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towns, bridge inspectors, maintenance personnel, etc.). Findings within these categories are likely to indicate that the site or structure is stable; however, these issues need to be regularly monitored by VTrans staff while a solution is implemented. In general, these findings have an urgency to them that requires a risk assessment of condition before a solution is implemented. A critical finding shall be resolved within 90 days, while an expedite finding will generally have a longer implementation timeline, (an example might be within the construction season or once the snow melts and spring runoff subsides). Determination as to whether or not a finding is critical or expedite will be made once the appropriate information has been obtained and the transportation risks have been identified and assessed.

When findings of this nature are being considered, the entity identifying this concern should contact the AMB Bridge Inspection Unit for a review by the appropriate Bridge Inspection Team. The appropriate Municipality, Maintenance DTA, General Manager, District Project Manager and Bridge Maintenance Engineer will also be notified of the potential finding. Once the risk level is determined within the one of these two categories, AMB will notify and consult with the VTrans Bridge Maintenance Working Group to determine the appropriate responsibilities for implementation of the solution.

- c. **Maintenance Findings:** Maintenance findings will come in throughout the year through several different channels. The following is intended to indicate the various methods of how these will be identified while providing a consistent method of how solutions will be implemented.
1. **Bridge Inspection Findings:** Bridge inspection findings will be identified throughout the year based on the annual inspections from the AMB bridge inspection teams. These findings will define what the issue is and make generalized recommendations based on the identified issues and concerns. These findings may fall into one of the four categories noted above and, if so, will be handled through the associated process.
 2. **Maintenance or District Findings:** Maintenance staff may identify bridge issues throughout the year. When a finding is not determined to be an emergency or urgent, the district and/or municipality should **review the bridge inspection report on VTransparency** (<http://vtrans.vermont.gov/vtransparency>) to determine if their observations are consistent with the latest bridge inspection finding. If there are any noticeable differences and/or changes then the finding should be sent to the AMB, Bridge Inspection Unit for follow up. ***Any finding that has the potential to have an immediate impact on public safety will be addressed as identified above in Part (3)a.***
 3. **Other Findings:** Occasionally bridge needs will come into VTrans from entities other than those noted above (traveling public, town officials, other state employees). These findings should be reported to the AMB Bridge Inspection Unit for appropriate assessment and/or action.

- d. **Cyclical Maintenance Findings:** In general, cyclical maintenance activities will be identified and addressed on an annual basis in alignment with Agency performance measures and available budgets. If a cyclical maintenance concern is identified, it should be treated similar to a Maintenance District Finding and reported accordingly.

2. Process Documentation:

The Bridge Maintenance Working Group will be responsible for ensuring that all bridge findings have been assessed, classified and that appropriate roles and responsibilities have been determined and assigned.

- a. The top four categories of bridge findings; *Immediate, Urgent, Critical* and *Expedite* will all be issued a Bridge Inspection Finding (BIF) and documented on the Highway Division Assets Sharepoint Site under Emergent Needs, AMB Sharepoint link shown in section IX. At this location each bridge finding will be considered an emergent need and the finding will include all relevant information as to the issue, the classification, the responsible entities, task listing and schedules.
- b. All categories of *Bridge Findings* will be collected, documented and reviewed by the AMB Budgeting and Programming Section on an annual basis. At the completion of each inspection cycle in the fall of each year, the AMB will review all bridge findings from the previous inspection season to ensure that they have been entered into the master bridge finding database. This review will include:
- Comparing the bridge finding to the latest bridge inspection reports
 - Reviewing the upcoming bridge programs to identify schedule and scope of existing projects
 - Providing an approximate cost estimate for the work to address each finding
 - Prioritization of each finding
 - Review of findings to determine if opportunities exists to consider:
 - A corridor approach to addressing multiple findings
 - Possibility of combining work with already programmed maintenance activities or capital projects.
 - Review of available funding

Once the review is completed, by January 15 of each year, the AMB Budgeting and Programming Section will provide recommendations of capital projects or maintenance activities to resolve each finding. Recommendations may include “do nothing” coupled with a specified monitoring schedule. Recommendations will be provided to the Bridge Maintenance Working Group for review and concurrence. This review will include assigning the responsible section for delivery, budget appropriation, schedule, and delivery mechanism. If the repair is determined to be a capital project, it will be programmed in VPINS, a project manager will be assigned and the project will be tracked through the VPINS application. If the scope of the project is appropriate it will be assigned to the District General Manager for delivery. A work order will be generated in VAMIS, assigned to the applicable District General Manager, and tracked through the VAMIS applications. The State Bridge Maintenance Engineer will monitor the progress of the work orders, performance goals, and cyclical maintenance

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activities with the District General Manager on a monthly basis. The District Management team, bridge maintenance supervisor, and technical staff are responsible for ensuring that work is being reported correctly.

C. On an annual basis, *Cyclical Maintenance* findings and needs will be reviewed and documented by the AMB Budgeting and Programming Section. In the fall of each year, the State Bridge Maintenance Engineer will work with AMB to review all cyclical maintenance, accomplishments, findings and cyclical maintenance performance measures to determine the needs for cyclical maintenance activities for the upcoming year. This review will include:

- Comparing the cyclical maintenance findings and needs to the latest bridge inspection reports
- Reviewing the upcoming bridge programs to identify schedule and scope of existing projects
- Providing an approximate cost estimate of the work for each finding
- Prioritization of each finding
- Review of findings to determine if opportunities exists to consider:
 - A corridor approach to addressing multiple findings
 - Possibility of combining work
 - Combining work with already programmed capital projects
- Review of available funding
- Review Performance Measures and Best Management Practices in conjunction with the Bridge Maintenance Working Group.

Once the review is completed, by January 15 of each year, the AMB will provide a recommended list of all cyclical maintenance activities for the upcoming season to the Bridge Maintenance Working Group for concurrence. This review will include assigning the responsible section for delivery, budget appropriation, schedule, and delivery mechanism. A work order will be generated in VAMIS, assigned to the applicable District General Manager, and tracked through the VAMIS applications. The State Bridge Maintenance Engineer will monitor the progress of the work orders, performance goals, and cyclical maintenance activities with the District General Manager on a monthly basis. The District Management team, bridge maintenance supervisor, and technical staff are responsible for ensuring that work is being reported correctly.

IV. Maintenance Program Activities:

Condition Based Maintenance Activities:

Activities that are performed on bridge elements as needed and identified through the bridge findings process to restore the structural integrity and correct major safety defects. As described earlier in this document, condition-based maintenance findings will be the result of bridge inspections by bridge inspection teams or visual observations by other VTrans staff. The intent of the condition-based maintenance program is to annually implement a plan such that work can be implemented to meet the identified performance measures based on available funding. Depending on the magnitude of the condition-based maintenance action needed, the work may be performed by the Maintenance Bureau staff, or included a project in which VTrans will obtain the services of a contractor.

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District and Contracted Activities: The following are activities that may be considered condition-based maintenance. While at times these activities may be performed by Maintenance Bureau staff, others will be noted if the nature of the repair is identified as beyond the scope, ability, or available resources within the District. The State Bridge Maintenance Engineer, District Managers, and Bridge Maintenance specialist are also responsible for planning activities that work towards the Performance Measure Goals and Budgeting. The list below gives an indication for some of the activities that may require greater discussion before actions are taken as to which party is to be responsible. Consultation with the State Bridge Maintenance Engineer if action is in question.

This list includes, however not limited to:

- Decks
 - Deck patching, crack sealing, membranes or overlays
 - Concrete curb and fascia repairs
- Bridge Joints
 - Bridge joint replacement
 - Bridge joint rehabilitation – armored joint/trough replacement
 - Deck Joint elimination
 - Plug Joint Replacement
- Bridge Railing
 - Bridge rail, posts and anchorage repairs
- Superstructure
 - Structural steel repairs – due to deterioration or impact damage
 - Bridge painting
 - Bridge bearing replacement
 - Reset bearings
- Substructure
 - Concrete bridge seat repairs
 - Concrete substructure repairs
- Scour Protection
 - Embankment restoration due to scour
 - Pier and abutment footings
 - Roadway slopes to bridge approaches
 - Channel slopes at ends of wingwalls
- Culverts
 - Culvert invert repairs
 - Culvert full linings
 - Wingwall/headwall repairs

As a reminder it is important to record and report activity accomplishments appropriately See the MATS Activity Guidebook for details.

Common Activities Used for Condition-Based Bridge Maintenance:

- 5120 Repair Bridge Joints
- 5122 Installing New Plug Joints
- 5123 Repairing Plug Joints
- 5124 Installing Steel Plates
- 5125 Repair Bridge Rail
- 5130 Repairing Structures
- 5140 Repair Bridge Abutments, Piers/Wingwalls
- 5141 Repair Bridge Piers/Columns

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- o 5143 Repair Wingwalls
- o 5144 Repairing Scour
- o 5145 Installing Catches
- o 5146 Repair/Install Troughs or Drains
- o 5160 Applying Bridge Deck Membranes
- o 5165 Repairing Bridge Deck
- o 5166 Repairing Curbs and Sidewalks

Cyclical Maintenance Activities:

Cyclical maintenance activities are those performed on a *pre-determined* interval and aimed to preserve the existing bridge element or component conditions. Bridge elements or component conditions are not always directly improved as a result of these activities, but the deterioration is expected to be delayed.

On an annual basis, VTrans will have a program to perform cyclical maintenance on interstate and state highway bridges. The intent of the cyclical maintenance program is to annually implement a plan such that the work can be implemented to meet the identified performance measures based on available funding. In general, cyclical maintenance activities will be performed by the Maintenance Bureau staff, however, opportunities may also exist to include cyclical maintenance activities in projects.

District Activities: The following are activities that are typically performed by Maintenance Bureau District staff that are intended to be on a cyclical maintenance schedule (not condition-based) District General Managers, District Project Managers, District Bridge Maintenance technician/specialist, are responsible for quality assurance of activities. The State Bridge Maintenance Engineer, District Managers, and Bridge Maintenance specialist are also responsible for planning activities that work towards the Performance Measure Goals and Budgeting.

This list includes, but is not limited to:

- Maintain Drainage –
 - o Clean out joint troughs, scuppers and downspouts.
 - o Unplug superstructure weep holes.
 - o Minor approach and slope repairs
- Bridge Washing –
 - o Pressure wash decks and bridge seats to remove chlorides and sand.
 - o Sweeping
- Surface Treatments
 - o Crack Sealing
- Debris Removal -
 - o Remove debris from superstructure bracing.
 - o Remove debris around piers and abutments.
- Traffic Safety Features –
 - o Clearances and load restriction signs are maintained and visible.
 - o Bridge Rail and approach rail, post and anchorage repairs.
 - o Minor bridge joint maintenance.
- Protective Coatings
 - o Grease structural steel at supports with expansion joints.
 - o Apply concrete protective coating (silane or current standard).

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As a reminder it is important to record and report activity accomplishments appropriately. See the Mats Activity Guidebook for details.

Common Activities Used for Cyclical Bridge Maintenance:

- o 4880 Bridge Washing
- o 5101 Bridge Sweeping
- o 5109 Crack Sealing Bridge Decks
- o 5110 Applying Preservative Materials
- o 5111 Cutting Brush Around Bridges
- o 5168 Greasing Beam Ends

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V. Performance Measures

As indicated throughout this document, the key to implementation of any program is to measure performance of the associated activities.

These measures are intended for both Long and Short Structures that are applicable for such treatment.

Annual Goal	Performance Measure
50% (alternating)	Washing Bridge - State highway and Interstate bridges (that are "Washable" bridges)
100%	Sweeping Bridges - by June 1 st (Also see Ped & Bike, Highway Sweeping locations for priorities due by May 31 st)
20% (alternating)	Applying Preservative Materials – (often referred to as Silane)
10% (alternating)	Greasing Bearings and Beam Ends
20%	Crack Sealing bridge decks (including curbs and sidewalks)
10%	Cutting Brush around bridges
100%	Emergency Bridge Maintenance is addressed immediately
80%	Identified Maintenance Needs, Bridge Inspection Findings (BIFs) are completed annually. BIF's are more serious findings are not maintenance needs.

Performance will be tracked with a dashboard that has been developed which currently pulls accomplishments reported in MATS and allows an easy view of the performance on cyclical activities. Performance of Condition Based activities will also be tracked with the maintenance dashboard to determine the percentage of Bridge Inspection Findings completed versus issued. In the future VAMIS will also be a tool used for reporting accomplishments, performance tracking, and generating the budget. Links for the dashboard, performance measures, and best management practices can be found below in section VIII.

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VI. Funding Bridge Preservation

Currently VTrans utilizes a combination of federal and state funds to fund bridge preservation and maintenance activities on interstate and state highway bridges. This funding is broken out in several programs and appropriations (primarily Program Delivery and Maintenance) and have historically been viewed as mutually exclusive sources of funding for bridge improvements. Moving forward, the Highway Division will be looking at the needs, the performance measures, and the ability to perform the work as one source of funding directed to improving one specific asset class, bridges. Discussions will occur within the Bridge Maintenance Working Group to determine annual programs of needs, work activities and recommended budgets. In addition, these various groups will align the need versus available funding so that the overall Highway Division asset needs and performance measures can be aligned when preparing budgets.

District Bridge Budget Building: The district requests funding each year to accomplish their bridge maintenance goals, the requests are reviewed by headquarters and once approved submitted to the legislature for budget approval. The funding is based on the following activities;

4880	Bridge Washing
5101	BRIDGE SWEEPING
5109	CRACK SEALING BRIDGE DECKS
5110	APPLYING PRESERVATIVE MATERIALS
5111	CUTTING BRUSH AROUND BRIDGES
5120	REPAIR BRIDGE JOINTS
5122	INSTALLING NEW PLUG JOINTS
5123	REPAIRING PLUG JOINTS
5124	INSTALLING STEEL PLATES
5125	REPAIR BRIDGE RAIL
5130	REPAIRING STRUCTURES
5140	REPAIR BRIDGE ABUTMENTS, PIERS/WINGS
5141	REPAIR BRIDGE PIERS/COLUMNS
5142	Repairing Bearing Seats
5143	REPAIR WING WALLS
5144	REPAIRING SCOUR
5145	INSTALLING CATCHES
5146	REPAIR/INSTALL TROUGHS OR DRAINS
5160	APPLYING BRIDGE DECK MEMBRANES
5165	REPAIRING BRIDGE DECK
5166	REPAIRING CURBS AND SIDEWALKS
5167	Repairing Fascia
5168	GREASING BEARINGS/ BEAM ENDS

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The spreadsheet used to build this budget is based on the above items and filled out by the district each fiscal year based on what they intend to spend on those activities, it does not include labor or equipment.

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1. On an annual basis, AMB and Maintenance will work together to review available funding for bridge maintenance in Interstate Bridge, State Bridge and Maintenance appropriations.
2. Based on bridge inspections, bridge inspection findings, input from districts and the bridge management system, a list of cyclical and condition based maintenance, condition based maintenance and bridge preservation needs will be identified.
3. These lists will be categorized and prioritized and a list of potential work items and/or potential projects will be identified based on the available funding. The list of potential work items will be reviewed to determine the impact on established performance measures.
4. The work will be categorized for implementation into four categories:
 - a. Bridge preservation projects: These will be set up as projects in VPINS with EA's and project managers. Project managers will likely be assigned out of Maintenance HQ or Structures groups. The budget for this will be tracked by the Bridge Maintenance Task Team and may be in either the Interstate bridge, State bridge or Maintenance appropriations.
 - b. Condition Based Maintenance – HQ: These will be the larger bridge maintenance projects. Cyclical maintenance and bridge preservation projects will be setup in VPINS with applicable EA's and a project manager will be assigned. These will be set up as projects in VPINS with EA's and project managers. Project managers will likely be assigned out of Maintenance HQ. The budget for this will be tracked by the Bridge Maintenance Task Team and may be in either the Interstate bridge, State bridge or Maintenance appropriations.
 - c. Condition Based Maintenance – District: These will be projects where work is identified for district maintenance personnel. Each district will have an VPINS project setup with an EA. Work will be identified at the beginning of each season with amount reserved for those basic maintenance needs that are identified throughout the year. Each district will be responsible for tracking the work, accomplishments and budget in this category. The budget for this will be in each districts activity based budget.
 - d. Cyclical Maintenance – An annual list of these tasks will be based on a tracking of accomplishments and performance measures. A project will be setup in VPINS with an EA. HQ will oversee the overall budget for these tasks and the statewide performance measures. Work orders will be assigned to each district, with an EA and the district will perform the work.

VII. Roles and Responsibilities:

District Transportation Administrator: Reviewing performance goals and tracking progress, work on resource needs to meet the performance goals, support General Manager, Project Managers, Bridge Maintenance Supervisor, and ensure they are following this guidance.

General Manager: Reviewing performance goals and tracking progress, work on resource needs to meet the performance goals, Support the Bridge Crew to accomplish their goals and ensure they are following proper procurement of materials and methods of repair, may require support from garage team members to augment bridge crews.

District Bridge Maintenance Specialist: This person or persons is responsible for coordinating and facilitating cyclical bridge maintenance within each district. They will be responsible to supervise bridge team, procure/track materials and address emergent issues.

Project Managers/District Techs: Provide technical oversight and guidance when bridge crews

are performing work, this may consist of checking cyclical maintenance work and condition based maintenance work to ensure procedures are being followed. Project oversight and inspection as quality insurance. Prepare Record Repair Plans as needed

Head of Bridge Inspection: Oversees bridge inspection unit, oversees bridge summary reports and issues Bridge Inspection Findings.

State Bridge Maintenance Engineer: Will provide technical guidance for cyclical and condition based maintenance and will be the person to contact when guidance is required on condition and cyclical based maintenance. Reviewing performance goals and tracks progress performed by the Districts and Contracted work activities. Continues development of the statewide Bridge Maintenance Preservation and Maintenance Program in conjunction with AMB. Leads efforts in coordinating efforts to meet programmatic goals. Monitors, reports, and tracks budgets.

TMC (Traffic Maintenance Center): The TMC will be contacted for any situations where traffic will be affected and will serve as a conduit to appropriate contacts in Bridge Inspection.

Bridge Maintenance Working Group: This group includes representatives from the AMB and Maintenance Headquarters. This group reviews and prioritizes preservation and condition based maintenance activities. Additionally, works in conjunction with others on developing maintenance budget.

Asset Management Bureau(AMB): Manages state assets and includes the bridge inspection unit, provides yearly lists of cyclical and condition based bridge maintenance activities. Provides guidance based on the condition of the asset.

VIII. Trainings:

Bridge Maintenance training will be provided yearly in the spring, topics covered in depth are proper repair methods, who to contact, how to purchase materials, and various other topics. As well there is a larger bridge preservation document that is covered specifying each group's responsibility when handling bridge maintenance. There are also trainings offered by the VTTC and online by AASHTO. People who will be required to perform bridge maintenance will need the following training.

List of mandatory Bridge Maintenance trainings: (Offered by VTTC) (In addition to the standard district maintenance trainings)

- Bridge Maintenance
- ServiLift (At least one representative per district)
- Confined Space
- Bridge Cleaning
- Bridge Washing
- Concrete Bridge Deck Patching
- Lead Awareness

List of recommended trainings: (Offered by VTTC)

- Temporary Bridge
- Basic Lead Awareness

IX. Links to other valuable resources and recommended trainings:

- FHWA Bridge Preservation Guide;
 - <https://www.fhwa.dot.gov/bridge/preservation/guide/guide.pdf>
- AASHTO trainings
 - <https://tsp2bridge.pavementpreservation.org/bridgetraining>
 - <https://vtrans.vermont.gov/training-center>
- AMB Sharepoint Site
 - <https://vermontgov.sharepoint.com/sites/VTRANS/ProjInternal/HighwayAssets/StructuresAssets/SitePages/Home.aspx>
- VAMIS
(Currently Under Development)
- MATS reporting guide
 - <https://vermontgov.sharepoint.com/sites/VTRANS/VTransIntranetHome/Highway/Ops/Shared%20Documents/Forms/AllItems.aspx>
- Performance Measures
 - <Z:\Highways\MOBMAINT\Performance Measures>
- Best Management Practices

- Z:\Highways\MOBMAINT\BMPs
- Bridge Maintenance Link to Dashboards (in development)
 - <https://app.powerbigov.us/view?r=eyJrIjojNDY1MmNmMGEMjY3NC00NDc2LTk3OWMtOWRlMjZhMzRmYWQ4IiwidCI6IjIwYjQ5MzNiLWJhYWQtNDMzYy05YzAyLTCwZWZWRjYzc1NTIjNiJ9>
 - <https://app.powerbigov.us/view?r=eyJrIjojNmUxNzRiYmUtNTI3Ny00ZmVhLTlhNzUtYWZmNzdhNmE4MzhliiwidCI6IjIwYjQ5MzNiLWJhYWQtNDMzYy05YzAyLTCwZWZWRjYzc1NTIjNiJ9>