Bridge Preservation Activities Report Out

2012 WBPP Conference
Vancouver, WA

Group number: 1	Discussion topic: BRIDGE PRESERVATION ACTIVITIES

Discussion Highlights (note main discussion items)

- DOTs represented: AK, AZ, MT, WA (2); 1 industry, 1 NCPP***
- Reviewed Guide pages 21 – 24 & state responses
- None of the 4 DOTs had formal program for joint replacement; WA trying to implement 5-year cycle of reseal/replace; some states try to tie bridge joint maintenance activities to planned pavement preservation/restoration projects ****
- Joint preservation needs identified during normal inspection activities;
- MOT considerations lead to tying joint preservation activities to other required work
- WA has grading system for evaluating district-by-district progress on eliminating identified maintenance needs; grading system relates to progress in eliminating backlogs; "C" is a good grade; an "F" grade in one area may lead to management shifting resources boost the performance in that deficient area; AK, AZ, MT do not have similar, formalized systems for evaluating progress ****
- WA – cabinet level status of DOT leads to direct control of programs, resources by Governor and legislature; created need for effective data driven system for documenting needs, costs, etc to inform the decision-makers and help overcome political considerations****
- AK – regions each given pot of money and considerable discretion in determining how/where the funds are expended***
- AZ Key personnel identify and program activities****
- AK MT WA have bridge crews. AZ contracts all maint.***
- Need a proactive approach (versus reactive approach); identify high priority activities (e.g., deck overlays) and focus resources to achieve desired results; need data to estimate needs, calculate cost benefits Vendor have to do****
- What additional inspection practices to DOTs employ prior to decisions on deck treatments
- All 4 states - very limited to no experience with CP systems on decks; AK has a few CP systems on bridge superstructures
- All 4 states - unfamiliar with ECE methods; no known examples
- All 4 states – no experience with replacing grated decks with lightweight concrete
- AK looking into zone painting under joints ****
- WA has concerns over costs, environmental concerns, performance of zone painting ****

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- AK – practices implemented to eliminate snowplow damage to sliding plate joints; CA has specifically designed joint features *****
- AK –
- MT – trying to eliminate asphalt overlays if underlying concrete is in good shape; if concrete is in bad shape, just replace with new membrane & asphalt overlay
- AZ – on a case-by-case basis, DOT installs overlays (mostly epoxy, a few polymer) when deck condition reaches 5 or 4
- WA - uses some simple life-cycle analysis calculations to decide action (continued patching, overlay, replacement) when a deck reaches 10 – 15 % patched areas *****
- AK – when deck projects are programmed, DOT forces survey deck condition with chain drag method to estimate condition and determine scope of necessary work**
- WA, MT developing test procedures to pre-qualify concrete mixes to eliminate excessive cracking
- AZ, MT & WA have process for access to completed bridge inspection reports by all DOT personnel *****
- AK – has some limited experience with passive systems
- WA – has some examples of active systems; in one case a system was turned off since corrosion level was low

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Implement grading system to measure performance in eliminating backlogs of deficiencies; ****
- Develop data driven process that illustrates different results based on different levels of funding ******
- Establish proactive approach (instead of reactive approach); identify high priority activities (e.g., deck overlays) and focus resources to achieve desired results; use information from data driven processes to support request for resources***
- Develop condition-based guidance, using engineering and economic analysis methods, on what actions to take on deteriorated decks ***
- Better exchange of information between groups responsible for design, inspection and maintenance on what works and what doesn't work *****

Group number: 2	Discussion topic: Bridge Preservation Activities

Discussion Highlights (note main discussion items)

How do you select BP candidates

Bottomline - Doing the right thing, using the right materials, on the right bridge, at the right time

- **Establish starting point**
- **Have desirable performance models with triggers**
- **Performing the work**
- **Followup to assure activities was successful and getting the info back into the quantified performance modeling for the asset.**
- **Asset Management – Be more proactive - negate reactive. Public entities need to be more business oriented.**
- **Need to educate public asset managers, why we need to spend $$$ on these good bridges rather than these bad bridges.**

Lack of communication between Design, Construction, Maintenance

Amount of consideration spent on design of deck joints vs whole bridge is usually quite small.

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

The most effective preservation activities

- **Don't always following the Band-aid approach**
- **Top priority - deal with the deck issues will pay big dividends**
- **Bridge Joints – even though work and $$$ for the work are small, payoff is big**
- **Drainage facilities leading joint header**

BP Activities

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

Suggestions to improve the develop of BP practices

- **Foster better communication between, design, construction, maintenance, material supplier**

Educate designers look at longevity and future cost of structures

Define and Monitor the bridge health rather than monitoring the SR or NBI Condition Ratings

- **CalTRANS model vs Pontis model**
- **NBI model is based on a failure model rather than a managing the asset**

Develop a Do Nothing Cost Model that include other considerations like dealing with various environmental issues.

Develop templates that would highlight maintenance strategies so that the public agency can publicize BP Activities. By educating the public you educate the politicians. Like Ribbon cutting events.

Group number: Table 3	Discussion topic: Topic 2

Discussion Highlights (note main discussion items)

Joints

NM-Mostly use strip seals with embedded anchors. Armored anchorages. Stay away from poured joints. Lots of wind causes debris to get into joints. Try to eliminate joints (10 years ago). Now not so much

AZ-0"-4" compression 0"-6" strip seal, modular joint. Debris is issue, very hot in day deteriorates joint material. Used integral abutment, but not so much any more.

OR – Good luck with asphaltic plug joints

Overlays

AZ-If within pavement pres project, bridge in project may get deck seal if NBI is 5 or 6. Also reduce dead load by eliminate AC overlays. AR-ACFC (recycled chopped tires) is used successfully. Or take off top concrete and structural overlay. Issue with thin decks on steel girders. Replace with thicker decks. In 1990's NBI deck =5 had cores taken and chloride profile (700 bridges). Use salt in northern part of the state. Sometimes bridges get AC overlays during pavement projects.

NM-Latex no longer used due to expense. Good success with epoxy overlays. Some deck seals. Some districts don't like deck seals. When the friction surface wears off, they think it has failed. Polyester overlays are just starting. Asphalt is used on timber bridges, dead load is an issue.

CP – NM and AZ no. Oregon does CP on the major coastal bridges. The use of pucks is an issue of discussion. Oregon uses metalizing with impressed current.

Deck Patching – AZ, the districts do the patching, may not be coordinated.

NM has bridge crews, some districts do more bridge work than others. Price agreements, so most deck patching is done under contract. Price agreements are by volume 0-10 yards, 10-50 yards, over 50. Use state and federal funds. There are three contractors that qualify. If federal funds, need lowest bidder. State funds have flexibility to use the best contractor who is qualifed to get the best quality.

Spot Painting –AZ few steel bridges, especially since the 1970's. NM is the same, but has a contract for spot and zone painting. They use it a couple of times a year.

Fracture Critical Members – AZ put additional girder in a two girder structure to eliminate a two girder system.

Thru Trusses- AZ and NM have very few thru trusses; Oregon has raised the portals on bridges.

Scour Countermeasures – AZ 2 Million dollars per year, soil is very sandy. New bridges are drilled shaft. For flash flood areas, there is a "floor" under the bridge. NM uses "wire enclosed riprap", huge mats, this is their bread and butter scour retrofit.

Seismic Retrofit – AZ completed the seismic retrofits (jacket the columns), restrainers to connect superstructure and substructure. Oregon has done some, but have quite a bit more to do.

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

NM has uses price agreements, so most deck patching is done under contract. Price agreements are by volume 0-10 yards, 10-50 yards, over 50. Use state and federal funds. There are three contractors that qualify. If federal funds, need lowest bidder. State funds have flexibility to use the best contractor who is qualifed to get the best quality. (Tried to share with California but had issues with procurement)

Fracture Critical Members – AZ had twin bridges that were 2 girder systems. Two girders were added in the middle, and the bridges were connected. AZ has 3 bridges similar to the Minnisota bridge, one is replaced, another is programmed, the third will be replaced. (Built in the same time frame). Third one could be historic.

Scour Countermeasures – AZ 2 Million dollars per year, soil is very sandy. New bridges are drilled shaft. For flash flood areas, there is a "floor" under the bridge. NM uses "wire enclosed riprap", huge mats, this is their bread and butter scour retrofit.

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

NO MORE EASELS!

WPP document – What is the goal of the document? Perhaps some input from industry? Look at what the other partnerships are doing. At least we are capturing information, it is a good start.

Provide contacts so we can see who is doing the same job in another state and benefit from their experience.

It is hard for a new product or idea to be introduced, it is a tough process. Sometimes it is hard to even "give it away". Engineering is a conservative environment, also transportation. Lots of risk is perceived with new products. Lab tests are one thing. Perhaps an allocation for pilot programs. The company needs to have the resouces to get products approved, it can take years. It is one state at a time.

Some states have more R&D (Virginia is an example), relationships with their home universities. Can be dependent on having a professor who is interested in a topic that will help get products tested.

Hard for states to quantify the gains of maintenance. How much more additional years are associated with a specific treatment? The Preservation Guide is a good start.

Each state is condemned to answer the same questions on their own. Perhaps we could use the information from other states to show that treatments work.

Group number: 4	Discussion topic: Bridge Preservation Activities

Discussion Highlights (note main discussion items)

- Joints: required to use joint-less bridge design where able – avoid joints
- The bridge system: install joint as a liquid that fills. You can reheat the joint if it gets nicked or something like that and will reset
- Joint leaks: some states accept the fact that they leak and focus on other counter measures (i.e. washings, removal, etc). Other states are serious about joint replacement, since they have seen so much damage caused by joint failure.
- Washings: permitting process is often a hindrance to this. Some states don't do bridge washing due to the environmental issues that cost to much to deal with.
- Decks: using chain drags vs. other technology.
- Limited funds so what do you do maintain. Some states accept that you cannot replace everything so they deal with symptoms
- What % of states budget is for certain items (like deck & joints). This varies by state/ area.
- Budget/ politics: how to you effect change, when you know there are issues that need to change?
- Data management system: for some states it is impossible to determine exactly what was accomplished, in terms of following recommendations. Most states can't correlate data for any real actionable plans – at least not feasibly.
- Lack of communication between inspectors & maintenance crews (two years vs. daily). This would greatly help everyone be on the same page and identify problems right away, thus saving time and money.
- Definitions of preservation: repairing a spall on a component of the structure vs replacing the deck. Maybe Type A Preservation = x, y, and z & Type B Preservation = e, f, and g (need better language than that).

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- Regular washings of deck (some states)
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Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Availability of data (data management system). A system that can show the full cycle of the repair (from recommendation, repair, to improved condition). Streamling work done vs needs
- Standardization of bridge preservation. What are the benefits of the preservation activity and what is the expected gain in life? How can we compare this product by product? Most states just do research on their own and not in a standard way.
- Develop definitions of categories of preservation regarding repair vs. preemptive and component vs. entire bridge

Group number: Table #5	Discussion topic: Bridge Preservation Activities

Discussion Highlights (note main discussion items)

4 vendors, 1 Fed, 1 ODOT, 1WSDOT

- Agencies are still looking for what are the right tools for performing repairs or Preventive Maintenance.
- ODOT puts a priority on the "High Value" bridges, historical bridges and bridges with deck areas greater than 50K square feet. A systematic process for doing PM is not yet established.
- The counties priority matrix has regional demands that skew allocated bridge dollars away from a true PM plan.
- Overall, due to funding constraints, the consensus is that current practice is mostly reactionary, and is not yet ahead of the curve to preventative.
- ODOT proactively performs scour, CP and painting programs to maintain their high value bridges
- Local Agency is looking toward starting a deck sealing program. Currently they proactively perform crack sealing at bridge joints and approach slabs.
- Education of Legislators is essential to show that sustainability of our infrastructure is improved with good PM.

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- WSDOT does a holistic approach to selecting bridge deck overlay or rehab candidates. Uses bridge inspection data to screen for candidates, then looks at the total bridge condition and future needs for the route for selecting the best candidate for PM.
- County agency is still in the reactionary role, and is looking toward prioritizing the worse first scenario.
- Joint repairs tend to be reactionary based on need. Local agency takes bridge superintendant out on inspections to develop repair needs.

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Round table discussions sharing ideas with agencies and vendors is very valuable.
- WBPP needs to proactively educate agencies as to what resources are available to them. "who do they contact", where do they go for help in resolving their bridge related issues.
- A case study behind each type of PM idea would be helpful. Possible references at the end of each section of the BPG links for case studies or other resources. Need pros and cons for all applications.
- Provide Cost/Benefit analysis tools to agencies for help in getting funding.
- Presentations should be published for on-line viewing.
- A webinar or forum to post questions that could have subject matter experts answer should be explored for feasibility. This could also have an FAQ forum available.
- A resource page for subject matter experts would be very valuable.
- Industry and Agencies need to develop Sustainability guideline for transportation preservation management. Use Industry and Agencies to educate Legislature.

Group number: 6	Bridge Preservation Activities

Discussion Highlights (note main discussion items)

Effectiveness of BP activities

- Joints– Are we keeping the joints clean of debris to allow for proper design of expansion/contraction? How often should joints be cleaned – Annually?

Most effective BP practices:

ODOT – Deck seals and joint replacements

WSDOT- Deck joint replacements, Deck overlays, Seismic retrofit & scour mitigation.

(Would like to see bridge cleaning become consistently funded throughout the state.

CDOT – Deck joint replacements, Deck overlays

Can states incorporate the use of more expensive products (i.e. MMFX, SS clad, galvanized reinforcement) and convince decision makers that life cycle costs will be lower.

ODOT is moving away from epoxy coated bar and may begin incorporating SS on the coast and black bar in the interior.

WSDOT uses epoxy coated bar has no apparent intention of changing based on current new construction occurring presently.

States are held to low bid to what is specified. States should consider the need to spec out products that have longer life cycles.

How do we measure the effectiveness of concrete repairs or even existing concrete? New technologies such as infrared rather than chain dragging.

Research completed in other states – It is questionable as to the application to other states or is further research needed.

Could states building bridges across the nation with new technology share the test data with those interested to promote the use of innovative products.

Environmental constraints take up a large amount of time and money to resolve if that ever happens.

Bridge Preservation needs to be considered cradle to grave. This begins at the planning/design stages, moves to bridge maintenance and preservation.

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

WSDOT has begun washing bridges again.

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Is design integrating new technologies (i.e. innovative long lasting reinforcement)
- Are life cycle costs examined closely to identify all possibilities no matter the cost to use the best longstanding products in our bridges?
- Continue momentum of bridge cleaning efforts. Again it's not something legislators understand but need to be educated. Work to develop relationships with your environmental people.
- FHWA division engineers should meet together annually to discuss new innovative ideas in BP to take back to their respective states to share.
- The design of a new bridge should be considered.
- European countries practices incorporate more expensive better quality products. What can we learn from these countries? Any possibility of a scanning tour to learn what other countries are doing such as in Canada.

Group number: Table 7	Discussion topic: Preservation Activities

Discussion Highlights (note main discussion items) Three states (Wa, Az, Or, Co-absent) 5 vendors (NYDOT), 1 FHWA (Az) & 2 from states (Wa, Or)

- 3 a) Preservation project selections: Wa-based on identified repairs- maintenance, project programmed. Maintenance set their priorities regionally; Bridge programs are managed by Bridge Program manager projects compete statewide based on given criteria…locals are not using BMS elements for system funding of SPM…
- AZ- some enough inventory work the inventory more intimately. "Triggers" that id needs…word of mouth feedback from inspectors. Could use a more systemized process for future needs. Program manager dedicated to id and plan Preservation needs…State funds are diminishing and moving more towards federal funding…
- The information is collected but how is it used to make selections…be proactive before it is a problem. i.e., washing decks on regular interval…
- Replacing/preserve minor bridge components to protect larger more expensive elements (joints protect girders-bearings)
- Focus on areas are region dependent…Wa/Or wet-corrosion, Az drier-but facing other challenges – dust/UV so the program has different focus thus direction.
- Make the contractor responsible for their work to complete per contract, which falls on maintenance to fix when contract goes a rye.
- Tools in Pointis that incorporate environment related deterioration rates.
- Resources needed to produce the program and monitor the data to build the case for funding and prioritizing the needs. At least one position that is champion of the program… possibly make use of interns to pull data together
- Are there Best practices in bridge design that impact/improve bridge life reducing maintenance etc…
- Congress considering funding tied to performance of repairs. How do different components compare across elements and value. How projects are selected based on performance.
- 3 b)

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- Bridge Cleaning
- Deck maintenance sealing, patching, overlay on SPM
- Getting feed back to designers on what works and doesn't. When things need to change.
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Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- be proactive with data collection before problem existing
- Replacing/preserve minor bridge components to protect larger more expensive elements (joints protect girders-bearings)
- Be more specifics in the (answers to question handout) WBPP bridge preservation practice on how things are preserved and how does it vary in different environments. Practices should define the regions the practice is applied in (arid/wet/cold/hot). Get information out on website. Note success to get approved process to facilitate SPM environmental issues (BMP'S)
- Challenge is not enough funds or means to move funds to areas needed.

Group number: Table 8	Discussion topic: Bridge Preservation Activities

Discussion Highlights (note main discussion items)

- WSDOT active preservation activities include deck, deck joint, and paint programs
- Idaho has been starting to use deck healer/sealers and has been getting good results, plans to grow in this program
- Utah's primary preservation focus is on decks and deck joints, and first things addressed with preservation dollars. When deterioration exceeds these areas, bridge is considered for rehab.
- Idaho has worked with bridge designers to get good details and materials with intent to minimize long term maintenance and preservation work.
- Discussion moved to inspection processes….Idaho inspects state bridges, uses consultants to inspect local agency bridges, has 5,000 bridges total. Utah inspects state and LA bridges with in-house crews, has 3,000 bridges total.

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- Utah does specific field visit for every bridge considered for preservation/rehab independently of inspection process, bases decisions in part on these field visits
- Idaho uses top ten list and inspection reports to decide how to spend money for preservation activities, but tends more to do separate site visit for rehab work.
- Utah uses scoping site visits to QA inspection process on occasion.
- Utah looks for future projects by comparing bridge inspection reports with BMS.
- Idaho uses top ten list, inspection reports and case-by-case evaluation and comparison
- Washington has bridge management group dedicated to allocating preservation and rehab work based on combination of data from inspection, BMS and historical contract work.

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Build more collaboration with industry and local agencies in developing preservation practices.
- Use standardized testing as used in datasheets - "datasheet protocol" as described in Vision 2020 document by ICRI and ACI.
- Assemble cost data, both construction and life cycle, for preservation activities.
- Followup research on preservation activities, particularly those based on material products, to assess effictiveness and overall performance.
- Provide data to inspectors about preservation work done, so inspector can provide performance feedback over time.

Group number: 9	Discussion topic: Bridge Preservation Activities

Discussion Highlights (note main discussion items)

- FHWA(1), WSDOT(1), Idaho(1),ex-Montana(1), vendors(3)
- Is joint elimination preservation work? Consensus was yes.
- Strengthening? Ok if to correct deterioration.
- Joints, decks, painting are critical activities.
- Preservation activity: Is industry involved in the planning process? – Typically not.
- Deck tests that can be complete quicker for condition assessment and damage assement.

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- WSDOT bridge washing process (working with the environmental community; work to identify and minimize associated obstacles).
- WSDOT deck preservation practice using modified condition state definitions.
- Montana deck survey info as practice (new, good, fair, poor [not as part of project]) to place decks in similar criteria (e.g. ADT, winter mtc.).

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Increase interaction between agency and industry to choose appropriate solutions.
- Improve deck or element testing turn-around time (ie chloride, delamination) .
- Develop decision tree(s) for process performance (life cycle, cost) data.
- Does the process improve or maintain baseline performance or slow deterioration?
- Protocol guide for "deck preservation" and decision tree is one example.
- Could be expanded to other components afterwards. (Joints, corrosion mitigation)
- Tools to decide when to no longer "preserve" a bridge.
- Place an emphasis on bridge "birth certificate" info to aid in ongoing decisions.
- Promote a common preservation language.

Group number: 10	Discussion topic: Bridge Preservation Activities

Discussion Highlights (note main discussion items)

- We're hoping to develop a spreadsheet within the next year describing the maintenance activities that each state is involved with, creating a tool that everyone can access. This will also provide everyone with a contact list for various activities and a list of best practices.
- Also looking to develop a list of vendors, what their products are and how they can benefit each state with their bridge programs.
- What are the limitations of the different systems that the vendors are offering? This information needs to be made published.
- Washington has experimented with the different deicing systems; salt, sand, brine, mag-chloride, beat juice etc. It has been about six years now, and they are preparing to see the effects of the deicing program.
- Missouri had a study come out in the last couple of years that defines what bridges are good candidates for the different overlay systems.
- UDOT is now putting in thin bonded overlays with each bridge. Surface preparation is very important for these systems.
- Montana – had terrible results with thin-bonded overlays. They threw out the baby with the bath water with a moratorium on these products. Now using latex modified concrete and silica fume overlays.
- There is a recognition that the states are looking for a history on the different products that are available for the different preservation systems and products.
- Communication, even between the different departments within a DOT, can be lacking. There needs to be this sharing of information.
- Lacks of communication between designers and those responsible for the construction.
- New design mixes don't seem to hold up as well as those that were poured 50 years ago. Montana is looking at modifying their practice, experimenting with different mixes. Effectively treating concrete cracking is one of their focuses.
- Montana uses hydro-milling to remove damaged concrete before overlaying – gets rid of the delaminations. Hydo-milling is much more cost-effective than rotor-milling.
- Practice to eliminate joints where possible. Joints are replaced in Montana when overlay projects are executed.
- Colorado has seen an alarming increase in structure deterioration with the advent of mag-chloride. Research has proven that this product is "unsafe to use with concrete structures" (see internet for South Dakota research findings).
- Wyoming's preservation work is centered around joints. Micro-silica is used in their overlay projects. They are getting away from latex-modified concrete. It is important to use evaporation retardants when using mico-silica to avoid concrete.
- Colorado has focuses on eliminating bare decks with water-proofing membranes with asphalt overlays. If joints can be eliminated altogether, that's even better.
- Montana tried two cathodic protection systems. One was vandalized, and the other was unplugged by maintenance forces.
- Sacrificial pucks have been used in some states, but none in Montana, Wyoming or Colorado. Washington is experimenting with these systems. They have found that the systems create high concentrations of hydrogen that must be accounted for by inspectors or maintenance personnel.
- None have used electrochemical chloride extraction. Idaho tried this on the Rainbow Arch Bridge.
- Fiber-wrapping has been used. These fixes have not been out there long enough to get historical data as to their longevity. No problems have been noted yet. There are concerns as to damage caused by ultra-violet rays and keeping them coated.
- Aqua-wrap in Washington has worked well for several repairs.
- Light-weight concrete: Colorado tends to avoid light-weight concrete due to past problems. Washington found that this concrete doesn't wear well for deck overlays.
- Biggest priorities are still deck overlays and dealing with leaking joints.
- Tracking of product and procedure performance needs to be shared between states.
- How do you track product performance within the bridge management systems?
- Eco-rock patching has been used in Washington's wet environment and seems to be working very well. It is easy to work with and seems to hold up well and washes up with water. It's very expensive.
- New bridges should be designed with preservation in mind. We know that joints and decks will require maintenance.

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

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Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Put on tsp2 site list of what each state does
- Have vendors /suppliers put services on tsp2 website as well