

**Report on
Washington State Forums
Vancouver, Spokane, Seattle
September 13, 15, 17, 2004**

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October 1, 2004*

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Background



Meeting Format

In early September of 2004, the National Geodetic Survey (NGS) and the Spatial Reference Center of Washington (SRCW) sponsored three forums on height modernization in Washington State. They took place in:

- **Vancouver, WA**, Vancouver Water Resource Center, September 13, 2004;
- **Spokane, WA**, Washington State Department of Transportation, Eastern District Office, September 15, 2004; and,
- **Seattle, WA**, Sandpoint National Oceanic and Atmospheric Administration, September 17, 2004.

The purpose was to provide an overview of the national program, review the current state and efforts of the SRCW and to gather diverse input from users of the Height Modernization Program on their important issues, needs and suggestions at the outset. It was important to inform potential users of a state-wide network what is happening at the state and national level, to provide examples of what has been done elsewhere and to collect their comments and perspectives on the planning to maintain a strong “user” focus.

The meeting format included morning briefings: NGS staff on the national program and a technical primer on Height Modernization: SRCW Leadership on the Washington’s State Efforts, and an example of how Wisconsin has implemented Height Modernization. In Seattle there was a short additional presentation on the Puget Reference Station Utility Network.

There was a brief brainstorming session to generate the issues and questions that were to be organized into topics and discussed in the afternoon. After lunch, the attendees were then asked to provide responses to broad topics with specific issues raised in the morning. Feedback was sought from groups of attendees on their current and future needs and requirements for organizing and specifying the Washington State program and their recommendations for a successful transition to a statewide system. Forum agendas and speakers are included in Appendix A.

Attendees

The meeting attendees consisted mostly of government (state county and city) surveyors and private engineering/surveying companies. The Vancouver Forum had 27 attendees including several from Oregon. There were 35 attendees in Spokane including several from Idaho and 53 attendees in Seattle. Many attendees came only for the morning, and this was particularly evident in Spokane (60% stayed the whole day) and Seattle (45% stayed the whole day).

Forum Evaluations

Vancouver

The Vancouver session had a total of 22 submissions with the following satisfaction levels (5 rating = highest satisfaction): 72% of the attendees provided a rating of 4 or higher on their feelings about what was accomplished and 77% provided a rating of 4 or higher on their satisfaction with the process.

Many of the attendees thought the highlight of the meeting were the afternoon discussion and participation. They learned the importance of going to NAVD88. Some suggested that more time for brainstorming or a smaller afternoon task would have been helpful.

Lessons learned: There was good interaction in the afternoon. It is helpful to see the other presenters slides and be able to coordinate the message. In the afternoon, we need to ask the groups to focus on the broad topic given and use the bullet points as examples only. Use a few obvious examples of the changes anticipated from using a height modernization system.

Spokane

The Spokane session had a total of 16 submissions with the following satisfaction levels (5 rating = highest satisfaction): 50% of the attendees provided a rating of 4 or higher on their feelings about what was accomplished and 62% provided a rating of 4 or higher on their satisfaction with the process.

For those that submitted evaluations, the highlights were learning about the need for height modernization and it's scope at the national and state level and an opportunity to voice their opinions in the group brainstorming while listening to different viewpoints. Several people commented that they felt rushed in the afternoon and wished they had more time on fewer topics. For others, the group process instructions were too complicated.

Lessons learned: We need to stress the role of the SRCW and its implementation plans. Having an assigned facilitator at the tables for the first few minutes would help get the groups off to a faster start. We want to have more diverse users represented: other federal agencies, universities and "green" groups.

Seattle

The Seattle session had a total of 20 submissions with the following satisfaction levels (5 rating = highest satisfaction): 70% of the attendees provided a rating of 4 or higher on

their feelings about what was accomplished and 100% provided a rating of 4 or higher on their satisfaction with the process.

Many of the attendees who submitted evaluations liked learning about the technical aspects from NGS, and the examples from across the states and within Washington. Many also commented that the highlight was the discussion with peers which developed partnerships and provided a broad perspective of views. Several attendees wanted to have the forums invite other users beyond surveyors and give them more details next time, focusing on 1 or 2 areas.

Lessons learned: Seattle was a great end to the sessions, having a facilitator at the tables help them to stay more organized, and changing our presentations for a better fit. Contacts were made and many folks were exposed to the SRCW. NGS has been supportive of the SRCW. We need a different process for organizing and creating topics over the lunch hour, may be having a few people the task with a pre-designed matrix and an on-site personal printer.

Topics & Major Messages*



*See Appendix B for group brainstorming data.

Themes From Across The State

Role of SRCW

- Data Management: Create easy access to data base and data conversions on the website.
- Manage data processing and review of projects, maintain quality control.
- Training: Technical training for consultants, contractors, public and private surveyors, utilities. Certification to qualify vendors for contracts and brief them on how to bid.
- Across the state representation: In site selection, developing priorities, hiring vendors
- Limit contracts to instate firms only and ensure regional awards using locality as a criteria of selection
- Show, persuade organizations to move to NAVD88

NGS Role

- Educational presentations, training, annual meeting
- Adopt NGS standards, procedures and specifications for data collection, equipment use, tasks
- Use NGS to coordinate with adjoining states

Regionalization

- Grow into a NW spatial reference center, especially for demographically connected areas

Outreach

- Educate citizens, governments on the practical benefits of height modernization, NAVD88 and cost sharing opportunities. Have a succinct cost/time/benefit message for potential partners.
- Conduct a shortened version of forum for politicians
- Expand to other folks representing GIS, educational institutions, ports, large private forest owners, regional government agency user groups
- Establish partnerships via interagency agreements

Issue: Use of Existing Data and Monuments

- Preserve tidal datum.
- Publish local network conversions
- Create programs to assimilate relationship of different datums
- Don't dilute with local surveys, have one system

Funding

- Secure funding to the state as a line item in the President's budget
- Use other funding sources: Federal Highway, Research

Washington State Vancouver Forum

Vancouver Discussion Topics	Vancouver Major Messages
Education and Training <ul style="list-style-type: none">• Education of local governments for their support• Training of private consultants• Develop model/means to get data used by outside community; to educate on time-dependent coordinates	<ol style="list-style-type: none">1. Develop standards and specifications for tasks to be accomplished (use of modern digital equipment)2. NGS Annual Height Modernization Workshops with actual training (leveling, software) – give way to consultants, agencies3. Work through county surveyor/director of public works4. SRCW needs a program to educate cities, county governments and departments on benefits of H.M. to promote use and possibility of cost sharing & implementation.5. SRCW training for contractors and contractor certification6. SRCW should sponsor local work shops for/and surveyors, utilities, contractors, etc. <p>General Post-report Comments:</p> <ul style="list-style-type: none">• Council of County• LSAW – private/public surveyors• Not just surveyors• County engineers• Work up chain re: HM• Educate that NGVD29 is “no more”• SRCW to integrate these things through committee of SRCW

Height Modernization Products & Technical Details

- What is the timeframe for actually having information?
- NGS guidelines for establishing “starting-point” for vertical control in a state/regional effort
- How will we maintain, protect monuments?

1. Real time GPS around the State
2. CORS/MON ownership management? (how to do this?)
3. Emphasize new CORS with levels
4. SRCW should develop quality control guidelines, review data and provide quality assurance for contractors.
5. SRCW should develop clear and concise guidelines for field and office procedures, starting points of surveys, etc.
6. SRCW develop an easy to access database (geographic based?) and become host to data and answer questions.

General Post-report Comments:

- Web presence and tools – is a SRCW priority
- CORS with leveled HTS. Proposed as pilot from SRCW

Politics – State & Federal Coordination

- Statewide adoption and coordination of accept NAVD88 by state, local and private sector; update, perpetuate existing mapping and infrastructure information
- Federal requirements – in tax base, to contribute to HM
- Budget implications and coordination between counties/local governments
- Several disinterested agencies, how to get them involved
- How are other fed agencies involved? FEMA/BLM/U.S. Forest Service

1. Consensus is to adopt NAVD88 by Federal, state, county and local governments (including utilities). Need SRCW or local groups to show and persuade organizations to move to NAVD88 (cost benefit)
2. Assist in creating program to assimilate relationship of different datum.
3. Identify the infrastructure and existing mapping which needs to be updated. FEMA, tidal, local utilities
4. Make it law with a timeline to convert or transition time
5. Demonstrate the practical side for H.M through outreach activities
6. Develop inter-local agreements with other agencies

General Post-report Comments:

No Comments

HM Organizational Structure

- Nonprofit the best way? How do we keep it going?
- How to get HM started in OR?
- Work done within an agency-effort goes to the cause, share/contribute to HM effort
- Equitable input among all groups with needs
- What will selection process be for consultants

1. At this time, it's the only game in town.
2. Go regional – would contracting requirement block.
3. Would public agencies have to contract to include their work in Height Modernization.

General Post-report Comments

- Cost sharing between state/local agencies
- No specific % of contracting “required”
- Evolution into “regional” structure

Funding

- National support to rely on funding
- Specific techniques for obtaining funding
- How is the money distributed equitably within Washington State?

1. Work to ensure broad representation across state when developing SRCW priorities
2. One needs to get political support for H.M and NOAA support of HM
3. NOAA/NGS – using their background to gather funding: SRCW should have a full time grant writer
4. Establish secure funding early on (i.e., President's Budget – state and local)
5. Show benefits of Height Modernization
6. Overall objectives

General Post-report Comments

- Federal highway work - plus “grant” or line item(budget) to support HM
 - State DOT can be mechanism for funding
 - Research fund (Federal) opportunities
-

WASHINGTON STATE SPOKANE FORUM

Spokane Discussion Topics

Spokane Major Messages

Practical Implementation

- QC/QA – how/who will monitor placement of monuments
- Council needs to address out-of-state monopolies of contracts
- Geographic locations of CORS stations – how will spacing be determined
- How is the selection process geared towards private firms given that we are in a competitive environment, how will committee be sensitive to firms' experience level, also how can obtaining equipment and training
- How will network priorities be established, e.g., will areas be done or will all primary across the state be done, then all densification be done

1. Primary and secondary control set by LS. If security problems occur, report to SRCW.
2. One consultant/company statewide to manage data processing. With 2 or 3 firms per region gathering field data.
3. Contracts to be awarded to instate firms only.
4. Contract Administration – which includes establishing evaluation criteria and qualification leased hiring.
5. Phased approach spatially and timing.
6. SRCW select sites with partners.
7. Depending on funding and number of primary stations with SRCW setting profiles.

General Post-report Comments:

- Federal Agencies should be involved.
- SRCW (or someone) to be responsible for overall processing/ review of projects within the State.

Training/Education

- Training in blue booking procedures
- Datum conversion issues – tools?
- How do surveyors integrate and perpetuate additional monumentation besides what is part of the Height Modernization Program

1. NGS or NOAA target classes on Bluebook procedures at LSAW conference for continuing education.
2. Agencies with their own Datums should be responsible for conversion to National Datums.
3. Training is absolutely necessary, together with a certification process to qualify the most number of Washington-based vendors for contracts.
4. SRCW could offer training through local seminars which would include hands-on experience with digital levels, etc.
5. There is a need to publish local network conversions (county, DOT, etc.)

General Post-report Comments:

- Who is responsible for publishing conversions? (No agreement in the group).
-

Existing Surveys / Perpetuation

- Private sector interest is in control being accessible, maintained
- How will sensible phase-in plan be developed to incorporate existing accurate control
- How will vertical control be perpetuated
- DOT has done a lot of network work that could be used, how can we use existing data (has this been submitted?)

1. The phase-in plan must be statewide to include the most players, and the initial contracts must be small enough for a quick turnaround.
2. Membership in the Spatial Reference Council required for data use, and a nominal fee should be charged for access to data. (\$1.00 per download?)
3. (TIE) need serious planning on location of central points. Emphasis given to municipalities, regarding monument destruction/corner perpetuation.
4. Existing data likely not useful; using existing data will likely impede progress of Height Modernization Project.
5. All data collected to NGS standards so existing system can be used.
6. SRCW should take on a maintenance responsibility and role and oversee local agency help.

General Post-report Comments:

- Opposing view on what to do with existing survey data.

Political Implementation

- Will restriction be to within state of Washington
- Council needs to address out-of-state monopolies of contracts
- Who maintains, manages, CORS stations
- How can we can achieve a balance between Spokane county and other counties
- What avenues are there to coordinate with Idaho and surrounding states

1. CORS Stations should be the responsibility of Federal Agency.
2. All contracts granted by State of Washington should go to firms in the State of Washington.
3. NGS should facilitate coordination with adjoining states to allow for seamless control network.
4. Project should include overlap into demographically connected area.
5. State QBS Law outline selection process; add locality as selection criteria.
6. Population is by nature will create need for more densified control.

General Post-report Comments:

No Comments

Spokane Discussion Topics	Spokane Major Messages
<p>Outreach</p> <ul style="list-style-type: none"> • How do we implement this aggressively – it is really needed! • Can these kinds of presentations be given to WASCE association of county engineers commissioners • How to combine efforts of state, local, and private • What is the NGS doing to improve communication between GIS etc. communities 	<ol style="list-style-type: none"> 1. a. Gather input regionally and then organize by state supervisors. b. Create regional user groups to include government and private representatives. 2. a. Strongly encourage shortened version of this presentation to politicians. b. SRCW should provide education coordinated with municipalities and local control nets. 3. NGS needs to provide support that is practical, doable, and including additional support that is available. 4. Strategic 5-10 year plan. 5. Expand to GIS, surveyors and educational institutes and cities. 6. SRCW to facilitate, coordinate, and establish partnerships with state, local and private coordination with other Government Agencies. How will this be done? <p>General Post-report Comments</p> <ul style="list-style-type: none"> • Interagency agreements between SRCW and state/locals. • Accept local survey into national database based on a level of accuracy...which is stated. Disagree, not automatically “HT MOD” – would be for different purposes. • Could have different depositories. • Eventually, we will go to <u>one</u> system (per #4). • Don't dilute!

Washington State Seattle Forum

Seattle Discussion Topics	Seattle Major Messages
Political	
<ul style="list-style-type: none">Continued funding and support for the program.Need a simplistic explanation of the problem we are fixing and the need to fix it.Is this pushing us towards a requirement to use state plane coordinate systemAbsolute necessity of state, county, cities to get financially involved in SRCW activities, e.g. fundingWhat is NGS' role in maintaining whatever comes out of SRCW	<ol style="list-style-type: none">Develop succinct, understandable cost/time benefit “sell” message for potential partners. May need to customize the message to potential partners.Identify potential partners in the State who might benefit such as ports, counties, cities, special use districts, large private forest owners, etc....more on board and it makes a better case for Federal funding.More funding for NGS. <p>General Post-report Comments:</p> <ul style="list-style-type: none">Examples from NGS of how other states have developed height modernization programs.How to get WA into President's BudgetLegislation requiring participation in Height Modernization
Education/Training/ Outreach	
<ul style="list-style-type: none">Educate users about datums – horizontal and vertical, dangers of mixingHave a sample or pilot project prior to plan for surveyorsFocus on end users besides surveyors, e.g. insuranceExplain to non-surveyors, what do you get from whom? E.g. NGS, SRCW, how much will it cost, who do you payCoordinating with on-going local geodetic networks.	<ol style="list-style-type: none">Develop Education Plan.Develop educational and outreach materials for specific levels and groups to build partnerships.Develop a pilot project and provide technical training. <p>General Post-report Comments:</p> <ul style="list-style-type: none">Target youth groups
Standardization	
<ul style="list-style-type: none">Quality control assurances, proceduresWho will set standards for data collection, who will process the dataWhat are the monument standards, will	<ol style="list-style-type: none">Define a scope of work to define the standards of each aspect of the project.Develop a format for the publication of

existing monuments meet those

the data.

3. Adopt NGS standards across the elements of the project were applicable.

General Post-report Comments:
No Comments

Seattle Discussion Topics

Seattle Major Messages

Technical/Practical

- Access to the network
- Modernization involves GPS, leveling, gravity – how much, where?
- What system are we going to expand – existing system? Something like WIDOT
- Coastal and island geography – how do we relate the physical systems
- Concern that there is enough 1st order levels, for the base network
- Tie into the tidal datums before the bench marks are gone

1. Distribution of Monuments: Do we use existing monuments or install a brand new network? What is the proper mix between continuous and monuments in the ground?
2. How much additional leveling, gravity and GPS will be required for modernization of elevations?
3. What criteria will be used to ensure monument stability? In many cases we must be more careful with siting. Convenience and property rights versus stability.

General Post-report Comments:

- How is it maintained; who maintains? Who updates?

Growth Beyond/Future

- What is the end product, e.g. system or bench marks, what datum will it use, will it be a dynamic system including software
- Will Canadian gravity data contribute to future models
- What is NGS' role in maintaining whatever comes out of SRCW

1. Important to establish a system in place to preserve, monitor and maintain monument locations.
2. Ultimate goal to have 100% real time GPS coverage of the state.
3. Goal for self-sustaining or perpetual funding and to grow into a NW (Regional) Spatial Reference Center. Federal Budget line item.

General Post-report Comments:

- Real-time tied to national network
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Appendix A

Forum Agendas

Vancouver Height Modernization Forum Agenda
September 13, 2004

Time	Topic	Presenter(s)
8:30 am	Registration	
9:00 am	Greetings and Introductions	Gary Perasso (NGS)
9:10 am	National Height Modernization Program: Overview	Juliana Blackwell (NGS)
9:40 am	Height Modernization Primer: GPS-derived Heights, Datums, and Coordinates	Renee Shields (NGS)
10:20 am	Break	
10:35 am	Wisconsin's Height Modernization Program	Darin Henkel (WisDOT)
11:00 am	Spatial Reference Center of Washington	Spencer Reeder (SRCW)
12:15 pm	Introduction and Identification of Discussion Topics	Philip Heller (Facilitator)
12:30 pm	Lunch (on your own)	
1:45 pm	Small Focus Group Instructions and Example	Philip Heller (Facilitator)
2:00 pm	Small Focus Group Discussions	Attendees
3:00 pm	Break	
3:15 pm	Small Focus Group Reports	Attendees
3:45 pm	Questions, Answers, and Wrap-up	Gilbert Mitchell (NGS) & All
4:00 pm	Adjourn	Philip Heller (Facilitator)

Spokane Height Modernization Forum Agenda
September 15, 2004

Time	Topic	Presenter(s)
8:30 am	Registration	
9:00 am	Greetings and Introductions	Gary Perasso (NGS)
9:10 am	National Height Modernization Program: Overview	Juliana Blackwell (NGS)
9:40 am	Height Modernization Primer: GPS-derived Heights, Datums, and Coordinates	Renee Shields (NGS)
10:20 am	Break	
10:35 am	Wisconsin's Height Modernization Program	Darin Henkel (WisDOT)
11:00 am	Spatial Reference Center of Washington	Spencer Reeder (SRCW)
12:15 pm	Introduction and Identification of Discussion Topics	Philip Heller (Facilitator)
12:30 pm	Lunch (on your own)	
1:45 pm	Small Focus Group Instructions and Example	Philip Heller (Facilitator)
2:00 pm	Small Focus Group Discussions	Attendees
3:00 pm	Break	
3:15 pm	Small Focus Group Reports	Attendees
3:45 pm	Questions, Answers, and Wrap-up	Gilbert Mitchell (NGS) & All
4:00 pm	Adjourn	Philip Heller (Facilitator)

Seattle Height Modernization Forum Agenda
September 17, 2004

Time	Topic	Presenter(s)
8:30 am	Registration	
9:00 am	Greetings and Introductions	Gary Perasso (NGS)
9:10 am	National Height Modernization Program: Overview	Juliana Blackwell (NGS)
9:40 am	Height Modernization Primer: GPS-derived Heights, Datums, and Coordinates	Renee Shields (NGS)
10:20 am	Break	
10:35 am	Wisconsin's Height Modernization Program	Darin Henkel (WisDOT)
11:00 am	Spatial Reference Center of Washington	Spencer Reeder (SRCW)
11:45 am	Puget Reference Station Utility Network	Gavin Schrock (Seattle Public Utilities)
12:15 pm	Introduction and Identification of Discussion Topics	Philip Heller (Facilitator)
12:30 pm	Lunch (on your own)	
1:45 pm	Small Focus Group Instructions and Example	Philip Heller (Facilitator)
2:00 pm	Small Focus Group Discussions	Attendees
3:00 pm	Break	
3:15 pm	Small Focus Group Reports	Attendees
3:45 pm	Questions, Answers, and Wrap-up	Gilbert Mitchell (NGS) & All
4:00 pm	Adjourn	
		Philip Heller (Facilitator)

Appendix B

Group Brainstorming Results



Washington State Vancouver Forum

September 13, 2004

Group Brainstorming Results

Group 1 Education and Training

Washington DOT(2), County(2) and Industry(2)

1. Work through County surveyors and Director of Public Works ✓✓✓
2. Identify other customers/users (e.g., irrigation districts/U.S. Army Corps) ✓✓
3. Build consensus with all local governments toward common goal and identify specific work to be done and topics for training
4. Identify appropriate (1 or 2) authority (if not surveyor or public works)
5. Develop standards and specs for tasks to be accomplished (use of modern digital equipment) ✓✓✓✓✓
6. Identify beneficiaries and get their involved in development of work plans. ✓
7. NGS Annual HM Workshops with actual training (leveling, Software) – give consultants a way to get up to speed ✓✓✓✓✓
8. Educate users on limitations of the data. ✓
9. How to integrate with legacy data sets and systems and datum

Group 1 Height Modernization Products and Technical Details

1. Get information around state early. ✓
2. Timeframe is dictated by funding
3. Make sure goal is attainable ✓✓
4. Provide easy-to-understand description of how new cords/heights impact users (make sure as many as possible users get information) ✓✓
5. Provide updates to organizations like LSAW ✓
6. Emphasize new CORS with levels. ✓✓✓✓
7. How to establish initial vertical control for HM.
8. Do regional projects and adjustments, then combine into a larger re-adjustment.
9. Location, location, ...
10. CORS/monument ownership management?? How to do this? ✓✓✓
11. Separate fund/co-op agreement to maintain networks ✓
12. Real-time GPS around the state ✓✓✓✓

Group 2 Politics – State & Federal Coordination

1. Necessary to have consensus to adopt NAVD88 by city, county, state, private utility and all Federal government. ✓✓✓✓✓
2. Justify the need to standardize datum (i.e., cost savings)
3. Using SRCW and local groups to persuade organizations to adopt NAVD88.
4. A representative from SRCW to solicit agencies to adopt NAVD88
5. Create a program to assimilate relationship of different datum
6. Identify the infrastructure and existing mapping which needs to be updated (FEMA, tidal, local utilities) ✓✓✓

Group 2 Height Modernization Organizational Structure

1. At this time, it's the only game in town – look who might step up (e.g., DOT, DNR, etc.)
2. NGS to standardize the model to implement and complete HM

Group 3 Funding

How is the money distributed?

1. Funding should be done to include not only Washington, but Oregon Regional – Northwest Region
2. Set by priorities set by SRCW which is set by SRCW Council ✓✓
3. Council education to the public
4. Work to ensure broad representation across state when developing SRCW priorities ✓✓✓✓

Specific funding techniques

5. Provide interaction to include lobbying
6. One needs to get political support of HM, and NOAA support of HM ✓✓✓✓
7. Research local government budget availability
8. Encourage public and private to work with smaller chunks to fit within their projects. ✓✓

National Support to rely on funding

9. Contact elected officials to support funding for HM
10. NOAA/NGS using their background to gather funding ✓✓
11. SRCW should think about having a fulltime grant writer ✓✓✓
12. Work with local Congressman/Senator to endorse funding for HM

Group 3 Politics – State & Federal Coordination

How are other Federal agencies involved?

1. Funding experience, work experience, management role, etc.

How to involve disinterested agencies

2. Communication and education of disinterested agencies
3. Utilize a website, create a information database ✓
4. Clearly demonstrate the practical side of HM through outreach activities ✓✓✓✓
5. Provide concrete benefits - work up numbers (i.e., money saved, time saved, etc. ✓✓
6. Create an electronic bulletin to show benefits
7. Educate and find common ground to show benefit to that agency

Budget implications

8. They could apply their work to HM with support from SRCW
9. Can SRCW loan out equipment to facilitate HM leveling? ✓✓
10. Develop inter-local agreement with other agencies ✓✓✓

Statewide adoption and coordination to accept NAVD88

11. Make it law, with a timeline to convert; or a transition time ✓✓✓✓✓✓
12. Adopting NAVD88 statewide: This is perfect time, as part of HM

Group 4 Funding

Specific techniques for obtaining funding

1. Start from Federal government and down to local government
2. Private company funding across state (i.e., engineering firms such as Boeing)
3. Show benefits of HM ✓✓
4. Establish secure funding early on (i.e., President's Budget, state, local) ✓✓✓✓
5. Contact other organizations with prior experiences in funding (i.e., grant funds, membership dues, state distribution funds, etc.) ✓

Fund Distribution

6. Based on use
7. Overall objective ✓✓✓
8. Show me the money ✓✓

Group 4 Height Modernization Organization and Structure

Nonprofit the best way?

1. Time will tell ✓✓
2. More potential sources for funding ✓✓✓

How to get HM started in OR?

3. Go regional – would contracting requirements block going regional? ✓✓✓✓
4. Would agency work be shared with HM?

Work done within an agency-effort goes to the cause, share/contribute to HM effort

5. Would public agencies have to contract to include their work in HM? ✓✓✓

Group 5 Education and Training

Education of local governments for their support

1. Contact with county/city government agencies for support
2. SRCW needs to begin an educational program
3. Multi-tier planning and cost sharing

Training of private consultants

4. Support from private sector - how do we teach them?

Develop model/means to get data used by outside community; to educate on time-dependent coordinates

5. Local workshop/groups to create local support (top of local government agencies – private and other users)
6. Develop training (NGS blessed) that all participants must complete in order to get invited to RFQ

Group 5 Height Modernization Products and Technical Details

1. Early development of QC guidelines
2. Who does QA and blesses data? Does SRCW have tech staff?
3. Who tells us what's good beginning points, standards, etc. or is it to be CA or WI style?
4. Where does new data reside? A local host?

Washington State Spokane Forum
September 15, 2004

Group Brainstorming Results

Group 1 Practical Implementation

- A-1 SRCW in conjunction with WSDOT, Government agencies and private. ✓
- A-2 Primary and secondary control set by land surveyor. If problems, then problem is reported to the Council. ✓✓✓
- A-3 One company statewide to manage information including processing with 2 or 3 firms in each regional gathering field data. ✓✓✓
- A-4 Identify existing control, quality and condition. ✓
- A-5 ~~CORS stations should be 20-10 miles apart. Secondary should be 5 miles apart.~~ (Deleted by Group)
- A-6 Contracts let to instate firms only. ✓✓
- A-7 Network should be designed by firm doing the end processing...who should provide equipment and training to regional firms. ✓
- A-8 Assess area needs for primary and secondary control.
- A-9 Let small projects and have statewide control and then densify.
- A-10 Hire 40 firms to set their receivers on a control point at the same time.
- A-11 Implementation goal of 8-10 years for completion (From Group #1 Outreach brainstorming).
- A-12 Establish contracts and award. (From Group #1 Outreach brainstorming)

Group 5 Practical Implementation

- A-1 (a) SRCW should oversee monitor placement.
 - (b) SRCW QA-QC
 - (c) Must be qualified (PLS); can be consultant, not necessary to be employed by SRCW.
- A-2 (a) How should contracts be set – use PSA – qualified. Use point system with extra credit in-state.
 - (b) Establish evaluation criteria. ✓✓✓✓ (#16a)
 - (c) Are contracts local or state wide?
 - (d) Are contracts a phase: (#16.1)
 - (1) Should be phased spatially and annually
 - (2) Phase by part of how (ORS, levels, etc)
 - (d) Phased in small enough parts so small firms can participate. (#16.2)
- A-3 (a) Different programs have different needs – whoever funds may have influence. (#10)
 - (b) Local interests (PRSN) can fund densification beyond basic need.
 - (c) SRCW should decide.
 - (d) Site availability, funding.
 - (e) SRCW work with partners to select sites. ✓✓

- A-4 (a) How many primary stations (#19)
- (b) Set priorities at Council (#19)

Group 2 Training/Education

- B-1 NGS or NOAA classes on Bluebook @ Land (LSAW), conference and coordinating continuing education. ✓✓✓✓
- B-2 ~~Bluebook training part of continuing education hours.~~ (Deleted by Group)
- B-3 Who pays for training – SRC? ✓✓
- B-4 Locally training be held. ✓✓✓✓
- B-5 ~~Annual land surveying conferences should provide training.~~ (Deleted by Group)
- B-6 Each agency should control datum conversion. ✓✓
- B-7 Make metadata a required part of submittals to agencies. ✓✓

Group 3 Training/Education

- B-1 Expand to School systems (colleges/universities) ✓
- B-2 Written procedures by FGCS available on website (SRCW, etc.)
- B-3 NGS set a standard for data conversions.
- B-4 Seminar(s) Book learning and hands on: ✓✓✓✓
 - (1) Classes to be in regional area
- B-5 Absolutely necessary certification process for QBC: ✓✓✓✓✓
 - (1) In state preference
- B-6 Advertise benefits to public.
- B-7 Spreadsheets available with procedure list.
- B-8 Create a scenario where membership in council is beneficial.
- B-9 Need to publish local network conversions (County, DOT, etc.) ✓✓✓✓✓
- B-10 Reporting on LCR Form 3D.

Group 3 Existing Surveys/Perpetuation

- C-1 Database should be maintained by 1 group such as NGS for quality data.
- C-2 Access to points accessible and secure. ✓
- C-3 Considerable more emphasis or “Threats” to various municipalities regarding monument perpetuation. ✓✓✓
- C-4 Phasing plan must be statewide to include most players. ✓✓✓✓
 - (1) Make contract small enough (Phase-in plans) for quick turnaround.
- C-5 The membership requirement for data use: ✓✓✓✓
 - (1) Membership fee
- C-6 Serious planning on location of control parts. ✓✓✓
- C-7 Institute a re-observation program.

Group 4 Existing Surveys/Perpetuation

- C-1 NGS continues but private will help, but to NGS standards.
- C-2 Existing control and mons start as just an existing mon.
- C-3 Solicitation of volunteers by council. Council is responsible for maintenance.
- C-4 Budget, yearly to maintain.
- C-5 Existing data goes away when new values established.

Group 2 Political Implementation

- D-1 ~~Wash, Spatial, ISPLA, ISAW~~* WSRC should be coordinated between states. ✓✓ (*Deleted by Group)
- D-2 LSAW should maintain CORS stations. ✓
- D-3 CORS stations should be the responsibility of a Federal Agency. ✓✓✓✓
- D-4 All counties should equally benefit.'
- D-5 All contracts granted by State of Washington should go to the State of Washington contractors. ✓✓
- D-6 Contracts from Washington State should be varying size to accommodate various sized firms. ✓✓✓
- D-7 NGS should facilitate coordination with adjoining states to allow for a seamless control network. ✓✓
- D-8 BOR is exempt from state implementation laws.

Group 4 Political Implementation

- D-1 Connect demographic areas of surrounding states.
- D-2 QBS laws in effect for contracts. Locality is a selection criteria in contracting.
- D-3 NGS manage data. Council establishes maintenance mechanism with local entities.
- D-4 Need more control in the more populated areas.

Group 1 Outreach

- E-1 Implementation goal of 8-10 years for completion. (See Group #1 – A-11 Practical Implementation – Brainstorming)
- E-2 Establish contracts and award. (See Group #1 – A-12 Practical Implementation – Brainstorming).
- E-3 Gather input regionally and then be organized by state supervisor. (See 1a under Outreach above)
- E-4 Create regional user groups to include governmental and private Representatives (See 1b under Outreach above)
- E-5 Strongly encourage shortened version of this presentation to politicians. (See 2a under Outreach above)
- E-6 SRCW should provide education and coordinate with municipalities and local control nets...and advertise. (See 2b under Outreach above)
- E-7 NGS needs to provide support too....what is practical doable and what other support is available. (See 3 under Outreach above)

Group 5 Outreach

- E-1
 - (a) Yah (#11)
 - (b) Need funding (#11)
 - (c) With a 5-10 year Strategic Plan (#11) ✓✓✓
 - (d) Expand on experience of PRSN to rest of state (#11) ✓
- E-2
 - (a) Yes (#14)
 - (b) Use connections to build more connections (#14)
 - (c) ~~Co-Engineer can help implement~~ (Deleted by Group)
 - (d) Expand to GIS, surveyors (LSAW, WCCS) educational institutions, WAC (cities) (#14) ✓✓✓
- E-3
 - (a) SRCW facilitate/coordinate state, local, private efforts in H.M. (#20) ✓✓
 - (b) Establish partnerships (#20) ✓✓
 - (c) Set up a forum to communicate program (#20) ✓
 - (d) Pool resources through coordination (#20)
 - (f) SRCW act as contact or clearing house (#20)
- E-4 NGS can answer (#21)

Washington State Seattle Forum
September 17, 2004

Group Brainstorming Results

Group 1 Political

1. How to sell the need for funding for Height Modernization ✓✓✓✓
 - Sell/explain HM results in uniformity and consistently
 - Simplify down to show what HM is and what benefits are derived
 - Problem – existing survey data is inconsistent and inaccurate
2. Will it be 100% Fed funds? ✓✓
3. Spend the money now – save \$ in future
4. Identify potential partners. (benefit and join) – i.e., port and other cities ✓✓✓✓✓
 - Bring in \$ support from outside engineering and survey professionals. (i.e., EMS, GIS, tracking, fear monger, etc.)
 - Work together to pool resources and minimize costs for all.
5. Create fee mechanism to require or allocate funds of HM on Fed project (Similar to 10% for art – i.e., 10% for HM)
6. Will the counties be involved in any funding support?
7. Mandate specifications for disaster relief funding (i.e., if don't comply, don't get the money)
8. Provide funding for NGS from Congress ✓✓✓
9. All Federal agencies should take the lead and establish a uniform HM system with free exchange of data ✓
10. Let doctors operate and let doctors set budget

Group 2 Education/Training/Outreach

1. Develop educational P.P (cartoon, publications, NGS – Medic and PowerPoint, etc.) – O/E
2. Specific training for users/potential users (targeted – T
3. Determine potential user groups - O
4. Develop education plan – E
5. Target specific groups - O
6. Develop partnerships – O
7. Through ESS, GPS guidebook, LSAW Convention – Readme files – E
8. Determine outreach - target potential new user groups – O
9. Research internet for articles on GPS for non-surveyors – O/E
10. Presentation & publications or public and private groups (Chambers, Boeing, etc.) – O
11. HM cartoon for grade schools – E
12. Tech. Training – produce specific information for individual groups – T
13. Outreach to political leaders for the need of HM – O
14. Educate on value of investment of final product – E

15. Keep the subject in the newspaper – O
16. Complete pilot project and publicize the results – E/T
17. Write up documentation to instruct companies on how to bid on SRCW scope - E

Group 3 Standardization

1. Types of MONS – depends on order of MON – A, B, C ✓
2. (2a.) Method of distributing standards ✓✓✓✓
 - (2b.) Who controls the warehouse of data?
 - (2c.) Website linking
 - (2d.) Standards way of reporting the work in progress by SRCW
3. Adopt NGS standards ✓✓✓
4. (4a.) Blue-booking primary control
5. Documentation standards, NGS, FGDC, WCC
6. Who will process and analyze data?
7. Who will QA/QC? ✓
8. What is the densification of monumentation?
9. Instrumentation – what can you use?
10. What is going to be scope of work for who project? ✓✓✓✓
11. (8a.) Should multiple agencies handle quality control; one agency or more? (Yes)

Group 4 Technical/Practical

1. (1.1) Transmitter vs. monument ✓✓✓✓✓
 - Mix between CORS and MONS in ground
2. How are we going to decide where the monuments will go, particularly in an area with islands? ✓
3. How much additional leveling, gravity, and GPS will be required for modernization of elevations, and where ✓✓✓
4. Who will have access to the network (and the how) ✓✓
5. Tidal datum – tie existing or new points into all tidal datum currently in use
6. (1.2) Where do we need real time capability vs. where do we need MONS
7. What information and schedule can we provide to groups with ongoing geodetic network activities?
8. How will the elevations change with time, and how will the recording of that be implemented?
9. How will monuments be selected for 1st order?
10. What criteria is to be used to ensure monument stability we need to be more careful about where MONS are sited ✓✓✓
11. Who will be responsible for the collecting and the processing of the data – who has final decision ✓✓
12. (1.3) Are we going to use existing monumentation, reobserve and upgrade; or put in a whole new network as Wisconsin did?
13. Who will maintain the network and the monuments?

14. How can we best coordinate Federal, state, university and local resources – public and private
15. Make sure the metadata associated with MONS or CORS stations is available

Group 5 Growth Beyond/Future

1. 100% real time GPS coverage for state ✓✓
2. Self sustaining funding ✓✓
 - NW (regional) special reference center ✓✓
3. Height Modernization only or data reference center ✓✓
4. Web site or subscription for data distribution of data
5. What is SRCW?
6. Now '88 datum – how often will system be updated to different datum? ✓
7. How will old datum (tidal) be incorporated/preserved? ✓
8. Incorporating with international entities
9. Systems in place to preserve and monitor MON. locations ✓✓✓✓
10. Future densification of the network ✓

Appendix C

Forums Evaluation Results

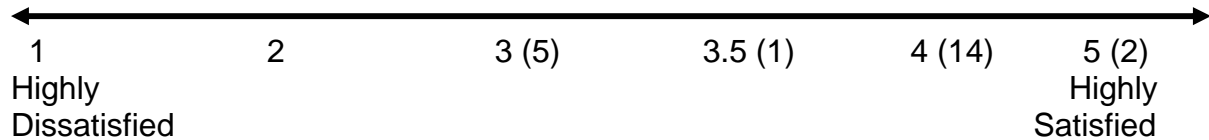


Washington State Vancouver Forum Critique September 13, 2004

The number of submissions (22)

1. Task Accomplishment

Overall, how do you feel about what we accomplished today?

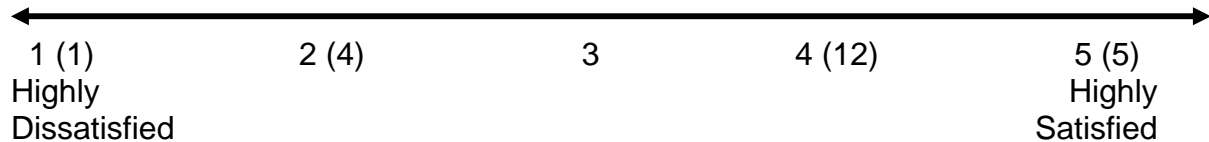


Comments:

1. Still some unknowns, but was quite helpful.
2. New understanding.
3. Securing funding is nothing new. Agencies cooperation is.

2. Group Process

Overall, how do you feel about the forum's process and the way we worked together?



Comments:

1. Very effective.

3. *The highlight of this meeting for me was...*

1. Meeting NGS and OR; so keep regional Presence
2. Learning the overall process
3. The facts because ... Learn the most; so keep facts updated.
4. Understanding the importance of going to NAVD88 because of the national significance.
5. Discussion groups because it brought out new ideas not before considered.
6. The afternoon because it created (we hope) something that can be used to educate management.
7. The group discussion and brainstorming session because of the diversified responses.
8. Getting to know and talk with surveyors because I am a dealer: So keep in touch and informed on current issues.
9. All of it! Learning and discussion.
10. Group input.
11. Brief overall explanation of HM because I now know the broader implication.
12. Very helpful...I do now understand the need to change to NAVD 88, so keep your good work.
13. Opportunity to brainstorm on SRCW and HM because we don't get much time to specifically focus on the effort.

4. *The one thing I suggest we change is...*

1. To keep stressing that NAVD 29 is not longer supported.
2. Less history more information on actual implementation
3. Give more time for brainstorming sessions.
4. Smaller afternoon task
5. Clarify objective of break out sessions a little more because we wasted important time on understanding process.
6. Nothing (2)

5. *Additional comments*

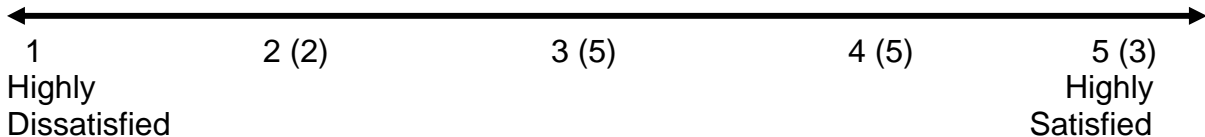
1. Secure funding first!!! And then find ways to keep the non-profit organization self sufficient by reinvesting the funds.
2. The audience was mostly surveyors. The morning was "preaching to the choir". Need to reach those that control the budgets.
3. Very good!

Washington State Spokane Forum Critique September 15, 2004

The number of submissions (16)

1. *Task Accomplishment*

Overall, how do you feel about what we accomplished today?



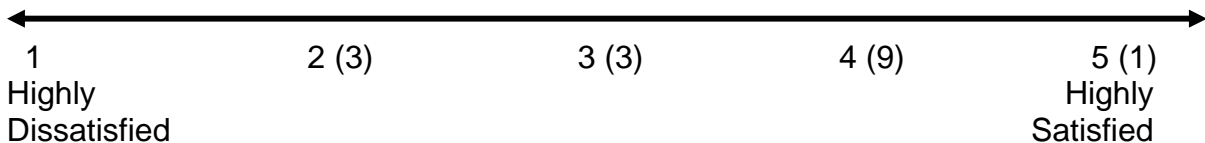
Note: 1 not rated

Comments:

1. Good project.
2. Was nice to hear other peoples opinions.
3. Input is nice, but the directions seems somewhat apparent.
- 4.-16. No comments

2. *Group Process*

Overall, how do you feel about the forum's process and the way we worked together?



Comments:

1. Brainstorming needed more structure and more time on less topics.
2. Time.
- 3.-16. No comments

3. *The highlight of this meeting for me was...*

1. Learning the problems and issues with the Spatial Reference Center.
2. It explained the need for HT MOD. So keep up the good work.
3. Interaction of good ideas, collaborations with different entities. Because what Wisconsin has done.
4. To hear about the hard work being done to promote and secure funding for SRCW. So keep up the good work, the check is in the mail.
5. The final reports because it helped clarify my thinking about our group conclusions; how we drifted off the work. So keep up this seminar/forum/collaboration facilitated, process.

6. Group discussion and brainstorming because there were different viewpoints and perceptions.
7. Learned more about different agencies, SRC, NGS, NOAA. So keep informing us about upcoming events.
8. A better understanding of the scope of the national and state project because NGS presentations; DNR presentations.
9. The question asking procedure before lunch because all questions were presented.
10. There appears to be good progress being made; lets get to work.
11. Network setup; layout of network.
12. Opportunity to voice opinions.
13. The group discussions on the implementation process because it brought the most diverse dissention of ideas; so keep doing these work shops nation-wide including in Idaho.
- 14.-16. No comments

4. *The one thing I suggest we change is...*

1. Not make it so complicated.
2. Nothing.
3. I was hoping the SRCW had a clear vision of what was going to be implemented and how they were going to partner or work with partner to complete H.M.
4. More time for brainstorming and a better clarification of H.M; because divisions/contract/SCRW/NGS/Locals.
5. When asking for discussion topics, start by giving the 5 categories. They will be divided into because it helps organize thought process of those asking questions.
6. Just a little less background on the geoid, etc., because most surveyors know it? (Not!)
7. A little bit more time because we ran out of time. It was rushed in the afternoon. Possibly begin sooner with a shorter lunch?
8. The working group exercise was difficult because the amount of instruction and steps were too much.
9. More time to process; rushed.
10. Do this in Idaho because N. Idaho and S. Idaho are 2 different regions.
- 11.-16. No comments

5. *Additional comments*

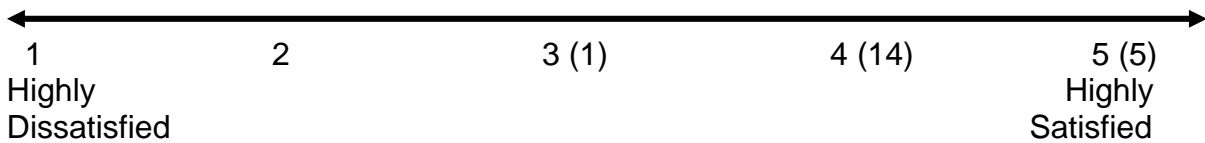
1. Good program.
2. Good work, good luck.
3. Thanks!
4. It would be nice to have classes on certain topics.
5. It was a great topic and I believe that a continuing education and input opportunity is needed.
6. Well done.
- 7.-16. No comments

Washington State Seattle Forum Critique September 17, 2004

The number of submissions (20)

1. **Task Accomplishment**

Overall, how do you feel about what we accomplished today?



Comments:

- 1. A lot to accomplish in one day, but was a good introduction and idea exchange!
- 2. If I was more knowledgeable on the process, it would have been more beneficial; but I am learning.
- 3. Much better understanding of both Height Modernization and SRCW.
- 4.-20. No comments.

2. **Group Process**

Overall, how do you feel about the forum's process and the way we worked together?



Comments:

- 1. Nice process for developing bonds and partnerships.
- 2. The presenters were excited about the HM Program and it was obvious they enjoy their work. He demonstrated that HM is feasible and it can be accomplished.
- 3. Great opportunity to work/share with other surveyors.
- 4.-20. No comments.

3. The highlight of this meeting for me was...

1. All.
2. Two way communication between NGS and the local surveyor because learning what may be the future of survey control is the future of my profession. So keep it all.
3. The discussion of the technical aspects of Height Modernization; combined Geoid.
4. Having NGS/NOAA people here meeting with us on a topic very important to us. We now feel like there truly is a partnership. So keep talking with the locals.
5. Every ones involvement in the planning process. The excitement this subject creates.
6. Discussion of PSRN and SRCW - direct application of developing PSRN CORTS network for my daily work.
7. Learning about Height Modernization, and participation in discussion about needs/priorities. I knew very little about this project. So keep up the good work.
8. WIDOT Presentation; good clear presentation.
9. Hearing from another state (WI); it was a very good example. So keep other states involved.
10. A very good start because overview, what SRC is, how its working other places, the solicitation of ideas. So keep the NGS folks coming out.
11. That HMP is run by states no NGS.
12. Hearing from NGS and the program. So keep providing follow-ups.
13. The presentations of the difference groups because them seemed to follow well together.
14. The meeting itself because it put in context what is happening within states across the US and within the states. So keep these meetings going periodically to communicate progress.
15. Renee Shields' technical presentation because I didn't know how the Geoid was derived. So keep giving technical presentations.
16. Better knowledge of the Spatial Reference Center. It is very important to update the current system. So keep the same presentation format.
17. Interaction between others. It gives individuals more of a broad aspect of what people's views and opinions are. So keep pushing!
18. The focus groups and sharing with peers. So keep in touch.
- 19.-20. No comments.

4. *The one thing I suggest we change is...*

1. In the future to have more with a more specific topic of Height Modernization.
2. Focus on people other than the surveying community. To increase funding and using data for emergency management and insurance (Firm).
3. I enjoy learning the technical aspects of Height Modernization
4. Simplify the message; it will sell better.
5. More NGS input because we can learn.
6. Keep this moving forward by having future forums become progressively more detailed; focus in one or two areas – such as funding, or standards and specification.
7. Go CORS – lose the local.
8. Bring in more people from different states to give other ideas about what they have done because it helped to hear from your peers.
9. The outreach to GIS and other professionals through marketing techniques “Height Modernization Project” (is technical) because they will ultimately benefit and they can be drives for funding.
10. Don’t change anything. Everything was fine.
11. Nothing.
- 12.-20. No comments.

5. *Additional comments:*

1. Good forum.
2. Coffee provided would have been nice.
3. Thanks.
4. Should have these forums at least every 12 months or semi annually. Thanks to all.
5. Thank you.
- 6.-20. No comments.