An Interview with

ANDREA T. NORRIS

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Conducted by Jeffrey R. Yost

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Abstract

With support from the National Science Foundation (Grant No. 0811988, "Designing and Using FastLane: Distilling Lessons for Cyberinfrastructures") CBI researchers Jeffrey Yost and Thomas Misa conducted oral history interviews with 70 NSF staff members as well as numerous additional interviews during 29 university site visits. An overview of the project is available at <www.cbi.umn.edu/oh/fastlane/> and a complete set of 643 publicly available interviews is at <dx.doi.org/10.13020/D6RG6B>. Here on the CBI oral history database is a selection of notable NSF staff including Joseph F. Burt, Jean Feldman, C. Suzanne Iacono, Constance McLindon, Carolyn L. Miller, Paul Morris, Andrea T. Norris, Erika Rissi, Craig Robinson, Mary F. Santonastasso, Rich Schneider, Frank P. Scioli, Beverly Sherman, George Strawn, and Frederic J. Wendling. Topics common to many of the interviews include the design and development of the NSF's FastLane computer system, interactions with users, e-government initiatives, grants management practices, peer review, and NSF policies and practices. These interviews span a wide range of NSF staff, from program officers to senior managers.

Andrea Norris was head of the Division of Information Services and provides key perspective on the organization and technical challenges of operating the FastLane computing system.

Yost: My name is Jeffrey Yost from the University of Minnesota and I'm here this morning on July 25, 2011 at the National Science Foundation with Andrea Norris. Can you begin by briefly describing your educational background?

Norris: I have a degree in economics, undergraduate degree. And I have an MBA with a major in Information Systems Management.

Yost: Where did you [interrupted]

Norris: Oh, from the College of William and Mary [is] my undergraduate; and George Washington University.

Yost: And I saw from your bio that you worked for Booz Allen [consultants]. Was that right out of graduate school?

Norris: No. Right out of undergraduate school I worked for a Presidential Commission here in Washington for about two years. It was the Grace Commission under President Reagan. It was a study to apply private sector business practices to [inaudible] some gains and business efficiencies from private business to federal government. Most administrations set up some type of activity like this. So I did that for a couple of years and then I went to work for Booz Allen and Hamilton for seven or eight years, and it was in that timeframe that I also became an MBA.

Yost: Okay. And was it primarily management of information systems work you were doing for Booz Allen?

Norris: Yes. Strategic management studies, information technology and information-related kinds of activities; systems activities.

Yost: And from there did you move to NASA?

Norris: Yes. NASA was one of my clients, and they wanted me to come on board with them, so I did that.

Yost: Do you recall what year that was and what your original job title was?

Norris: I don't know what the title was. Let me think. I was there 11 years; I left in 2001; so it would have been 1990. At the time, NASA had a program to oversee all of the management systems; agency-level management systems, as opposed to the mission-centric. So not their ground control, research network, control centers, labs, aeronautic systems. And so I joined that organization and helped work on a lot of NASA-wide enterprise-level systems, activities, programs, investment portfolios, practices, and so forth.

Yost: And I saw that you became Deputy CIO?

Norris: Management for the agency. I did that for several years before I left; [inaudible name] was CIO at the time. So once they created the Clinger-Cohen legislation, which required the establishment of CIO, somewhere in that mid-90 frame of time. And so I worked under [the] agency CIO's office from that point on. A variety of role and responsibilities, but for the last few years was the Deputy status for the management side.

Yost: And that included the research proposal side?

Norris: NASA had nine field centers, plus headquarters distributed around the country. In each, at the time, there were several science/mission enterprises so that included human space flight, it includes the space station and shuttle programs, it included the earth science program, it included the space science program, and it included the aeronautics research program centers and missions.

Yost: And you were there until 2001?

Norris: Yes.

Yost: Was there a electronic research grant submission system in place by the time you left?

Norris: By the time I left NASA some version, I suspect; but I can't remember specifically, now. At NASA we had a $2 billion IT budget; but that was all of

Information Technology. And so I didn't focus on any particular system but really the whole portfolio.

Yost: Do you recall if you heard about NSF FastLane while you were at NASA?

Norris: No, I had not heard of FastLane while I was at NASA.

Yost: Okay. And in 2001 you came to NSF, in what position?

Norris: I was the Director of IT; the DIS here. I wear two hats here. I'm the Acting Chief Information Officer and Deputy Chief Information Officer, as well as the Director of the IT theater for many years. I don't know exactly about how all the Deputy parts happened. It's been a long time.

Yost: And was it called DIS when you arrived?

Norris: Yes.

Yost: So it's been DIS continuously since then?

Norris: Yes.

Yost: Can you discuss your first impression of the IT infrastructure at NSF when you arrived?

Norris: It was not in a situation that was probably atypical for that time period. The perspective I think I can offer here for your study is NSF really played a key leadership role. It was also some of its research, early research work. This was also the boom of the Internet and the World Wide Web, and [NSF] really demonstrated the capability for using electronic government principles at the time as well as leveraging, harnessing the power of the web to conduct the business relationships, the business transactions with the research community. FastLane was the representation of that and it was the first time NSF had really done any kind of web development. It was done in a fairly short window of time with very active involvement and engagement with the research community. It depended on what organization you were from, or agency, or what industry; but that some adopted that very aggressively and some did not. So NSF adopted it very aggressively and worked with the community, helped really shape the product and the way things work. When I got here; arrived; and this is sort of thing maybe Dan Hofherr, Craig Robinson, or Fred [Wendling], or someone could give you a little better history here. My understanding was that for a variety of reasons -- I don't know that I know what they are -- the development work of FastLane was kind of taken out of DIS while it was early develop, spun up. It was the management dimensions of it. It may have been to foster the program officer kind of oversight involvement in the research community. And then [it was] put back in to DIS to be continued to support and operate, right? That's about the time I got here.

Yost: When it was being put back?

Norris: It had just been put back. So there's a branch being still called by the same name. I think it's External Systems branch? Is that right? And that was really the branch that was created to help FastLane external systems; systems for the external community. Prior to that point in time, the organization was kind of infrastructure operations, data center, network, internal types of applications for NSF staff. So when I got here this group had fairly recently been stood up; or certainly appeared to have been fairly recently stood up. Then FastLane was kind of where it was in its development cycle; which was pretty there. They had a lot of the major pieces of it but it was hosted in infrastructure servers, infrastructure separate from everything else. Also, before I got here they had transitioned from the mainframe as a primary platform to a client server architecture. So FastLane was the only web-based application. There were several other internal client server applications, and most of those had either within the last prior year or so -- or fairly short window of time -- had either been replatformed from the mainframe; which was mostly what happened, they were just replatformed; or were new and built on this client server architecture. So that's kind of when I got here, mainframe was just, you know, the big hill and getting off the mainframe. That happened, but client server architecture was the selected platform and then FastLane had been kind of reinserted back into the IT organization to continue its life and support activities. Does that make sense?

Yost: Yes, it does. Was FastLane client server from the start?

Norris: No. It was a web-based application. That was the only application that was web-based. When they went from mainframe to something else, the something else was a client server architecture, not web.

Yost: Okay.

Norris: So when I got here, we were kind of at the end of the heyday, and the hard work of getting the application; and FastLane is a suite of applications. Utilities; I'm not sure I'd even call some of the pieces applications, you know. It's a suite of utilities and applications. Services, we'd call them today that kind of grew up in a -- I don't know -- I'd say not an architected approach, but grew up more organically in terms of a sequence of what was done first, second, third, fourth. And then, most of that work had been done; the adoption was pretty high. It had been about a year before. I used to have charts that showed the adoption rate of what the bar adoption was by year. You know, in 1987 it was 25 percent submitted electronically, then 50 percent, then 75 percent. So it went pretty quick. So I was here right about when they were going from the 85 to 95 percentile to the hundredth; it was on its last stage of adoption.

Yost: I understand that October 2000 was when the mandatory [interrupted]

Norris: Yup. And I came in May of 2001.

Yost: So it wasn't necessarily 100 percent by that date, or do you recall?

Norris: I think the deal was is that Dr. Rita Caldwell [?] was the director at the time. There was probably a 'Dear Colleague' letter. I'm not sure how it was communicated but something was issued that said, 'effective this day, your proposal has to be submitted through FastLane.' There for a long, long, long time there was always a small, very small number that would still come in paper. But effective in October, so by the time I got here, everything hadn't come in electronic yet, but that was because it's just the nature of it a year or two out, submission cycles. But that was the intent of the foundation at that time. And that made a big difference, of course, when that was set up.

Yost: With EPSCoR states or HBCUs, was that a challenge to get them to submit by that date? Did they generally have the IT infrastructure to use FastLane when it was implemented?

Norris: So again, there was a high percentage of people already submitting electronically when that decision was made. I certainly wasn't aware of any pickups in terms of capability again because everybody doesn't submit on October 1. So there was plenty of time still out in the future and I think that's where the last 10 or 15 percent came in. [It] was not necessarily because they weren't capable, but because it wasn't time. Does that make sense?

Yost: Yes.

Norris: And I used to have -- I don't have it I'm sure anymore -- but I used to have a nice little bar chart that showed over the years (like three or four years) for the adoption and submission rates coming in paper versus FastLane; and so that's what I'm remembering. It went from like 85 or 90 percent that last year to virtually 100; 99 percent.

Yost: Can you discuss the infrastructure of the Help Desk when you arrived?

Norris: Yes, very symptomatic. So there was a separate Help Desk. NSF at the time had IT Help Desk for staff, and then had a separate Help Desk for FastLane people who were calling to submit through FastLane. As I said it was a separate infrastructure; it was on separate servers that needed various upgrading; there were some unusual budget funding constraints where a subset of program R&RA funds, Research and Related funds, could be used for certain kinds of IT investments. But there was some criteria associated with it. It had to externally facing, which FastLane met; meaning supporting the research community; or in pilot mode of some sort. So we were in pretty desperate need to upgrade the compute horsepower around FastLane and we used that argument in order to upgrade the; it was a 6800 Series, which we're just now actually retiring completely; Sun Fire 6800, I'll never forget that. (Laughs.) So we had to do some kind of creative funding; separate Help Desk; separate sort of staff who were responsible for operating and maintaining; separate contract for the company -- the company was CompuWare, I think, at the time -- who had the knowledge of the software itself. It was not documented very well, which was problematic from a systems operations and sustainability perspective.

Yost: Is CompuWare the main contractor that worked on FastLane throughout, or was there re-contracting and when did it [interrupted]

Norris: I don't know. Prior to the time when I was here I believe they were the primary contractor that developed the system. They stayed on contract doing FastLane support for a couple more years after that. Then it was competed and it's been supported by multiple companies since then.

Yost: You mentioned that with FastLane, research funds were funneled into DIS, in part. To your knowledge, was that the first time that that was done? And was that the only project where research money was coming into DIS?

Norris: Not research money. We have a couple appropriations structures. Research and Related is one of the appropriation names. And EHR, Educational and Human Resources is the other. and then we have an administrative account, which is largely for training, travel, salaries, rent, you know, things of that nature. And so historically the technology was predominantly funded by this administrative appropriation but because FastLane was dead center designed to support ***the*** research community and the research process, the merit review process. We were able to legitimately use funds from those accounts to augment some of the investments for FastLane.

Yost: NSF tries to keep the administrative [costs] a low percentage.

Norris: Right. And so just because it's out of the Administrative and Operations Management Appropriation; it used to be called S&A, Salaries and Expenses Appropriation; but just because it's out of that account doesn't mean; there are administrative costs besides what that account does. In addition to that account, so anyway; it was just a good demonstration and a much needed one of how technology that is designed solely to support the research mission. You know NSF had the good common sense and judgment that it made sense to fund it with some interesting new ways.

Yost: There are both internal and external advisory groups in the development of FastLane. Were those continuing as different functionality of it was being introduced and for subsequent iterations after 2002?

Norris: There weren't a lot of subsequent iterations for FastLane after I got here. We were really largely in a maintenance [mode]. Because of the way it was built, it wasn't like we architected this whole wonderful system and then we built the modules in this orderly fashion. It was less [?] organic and it grew up in a fairly short time with really, with the resource community-centric with whatever is needed, you know, however it should look kind of thing. So there was a lot of work done in that first year to two years, I would say, to just stabilize it; to stabilize performance and availability. You know, we had peak loads. Still people will wait, you know 80 percent will wait until the last hour or two to submit to a deadline, and the system couldn't support those kinds of loads. So we spent a lot of time on just getting the capability, performance up; you know, all the

standard things. Availability, performance, redundancy, fail overs, automated fill, you know all those kinds of things in place. Technically architecting some of the components so they were [not] so expensive to support. Redoing some of the interfaces. Provide online help. Things like that to make it easier to use and more efficient to support. I'm trying to think if there was anything new subsequently added after that, in terms of function. Dan Hofherr would be the best person to ask that, but I can't think of any. We did some project reporting kind of capability. People liked the functionality so it was really more fine tuning it, cleaning it up a little bit, getting the performance working. A lot of effort there. And so one of the things that we did is there's a process to review internally prior to solicitation opportunities and announcements being placed out for the community and so the FastLane did it. IT, DIS became a checkpoint in that to make sure we didn't have 10 major program deadlines all on the same day because the system wouldn't support it. And there would always be a little bit of negotiation back and forth just to spread things out a little bit because of technology. We don't really need to do that today but in those early days we did.

Yost: What about interaction with policy office?

Norris: That's Mary's office. So the FastLane reflects community-centric needs but the policy's in the foundation. So there were close interrelationships with that. They set the process and policy perspective; we still work with them closely on that. I don't know if this is relevant to your study or not, but the FastLane was step one. Technology and business capability's always changing so once FastLane was put into place, and we spent

a couple years really fine-tuning the functionality and capability and resilience of it, then the next thing we did was shift to something called E-jacket, which is an internal application, modeling off of some of the capabilities and lessons learned from FastLane.

Yost: Was E-jacket already a project that had started by the time you got to NSF?

Norris: No, we started that. So E-jacket was the pathfinder for the future for staff capabilities. So it was going to be done in the web environment; it leveraged the interactive panel system. So the proposals come in now it's in NSF's door. A jacket is a folder, so everything was paper before. And that folder was to have everything about that proposal, including any process, and individual comment, writings, e-mails, etc. And that [jacket] was official record. So we switched to an electronic version of that.

Yost: What [was] the origin of the idea for moving from paper jackets to electronic jackets?

Norris: Really because of the success of FastLane and the electronic experience; positive outcomes of the electronic experience. So they've got all these things that used to all come in paper and now they're coming in electronically, but then I have to turn them into paper for the staff inside to actually do anything about it. So it was a natural extension of FastLane.

Yost: But that's something you decided to move forward with?

Norris: Well the foundation decided, I didn't personally, you know. It made a lot of sense to the foundation to move forward with that. So we put forward E-jacket as the name for electronic jacket, and it just allows once the proposals come in it goes to the appropriate program, staff can decide whether this should be assigned to them or maybe someone else. It'll help with doing those kinds of things. And it helps support, to a certain extent, the conduct of the peer review process. So here we have some legacy kind of capabilities. They kind of jump in and out between those two, to a certain extent. Get your reviewers, get your capabilities that you need, get all the logistics set up, bring the people in and do the mail reviews, go through the whole recommendation process and then I (as a program officer) will then make my recommendation, internal to the NSF management. And so E-jacket helps all that work flow. So there's all kinds of rules, and policy checks, and balances and things in that process. And it includes capability for any of the e-mail correspondence, notes, informal things, anything. It will hold all of that documentation so it really is an electronic version of this jacket. So it's like a work flow and document management decisions [inaudible] capability. And so we have since gotten approval from NARA [National Archives and Records Administration] that they will accept that electronic jacket record as our official archived record. That happened last year. I think it was effective January about a year, year and a half ago. So that helped complete a lot of that staff processing time. So now the opportunity's posted electronically; your proposal comes in electronically; it's processed by our staff in an electronic environment, as an extension to FastLane; it's project reports; all of the things that need to submitted by a PI or the institution come in again through FastLane; and then

again, our systems internally help support that processing side. So that was the natural extension after the first two or three years kind of stabilizing FastLane, and getting it working. And it's a work horse for us; I mean, still, it's a huge work horse for us. Then E-jacket came in and had its corollary type development approach and went into place incrementally, but the real punch of having most of it finished up about two or three years ago. But that's not the end of the story. So now you've got to flash forward to 2007 let's say. FastLane's not a baby anymore. Now it's an aging work horse and E-jacket is still in its development, and then you have the government [inaudible] activity with Grants.gov trying to move to these common government-wide services, which was a huge push. And so Grants.gov was a big priority because at the time there's like $50 billion being spent on federal grants. The research component of that is quite small, but it's very high in volume. So high volume transactions, but not where the big money is. So government made the decision to go to a common grants supporting capability, and that was block grants, discretionary grants, state/local grants, and research and related. So NSF, particularly because our experience and leadership role with FastLane, has been a key player in that government-wide grants activity. And so Mary Santonastasso, why I think it's really important for you to talk with her, has served largely as NSF's representative for all of the government-wide grants activity.

So step one was to deal with Grants.gov. HHS was selected as the lead and the decision was to basically post the solicitations and allow for submission of an application. It was very straightforward, very easy for the block grant, kind of formula grant capability. It was not nearly as easy, of course, for the research and related. And so NSF really helped

[with] a lot of work. It was a lot of folks in the [inaudible] shop and the policy shop, to come up with data standards in what was initially the application. They called it R&RA data set; standard data set working with NIH, and DOE, and NASA and, you know, all the agencies to come to agreement. The FastLane NSF data standard at the time was probably 90 to 95 percent of what was eventually adopted. And so FastLane, that experience there and having to come up with a capability there really helped at the government-wide level in ways that were never imagined. And so the posting of solicitation, and then the submitting the application. What we found was that the research community and then our community was not as enamored with Grants.gov initially for a lot of reasons. New technology doesn't always work exactly the way you expect or it's supposed to. So we went through a lot of the same growing pains. But NSF wasn't always a strong supporter of this. This is exactly what we had gone through for FastLane. But we felt really strongly [that] there were a number of things that Grants.gov capability at the time, and for the foreseeable future, wasn't going to support. And so we were committed to sustaining, maintaining FastLane without any new serious money going into it.

Yost: What types of things?

Norris: It didn't support collaborative proposal processing, or development. Are you familiar with Grants.gov?

Yost: I haven't submitted on it but I've talked to a lot of people.

Norris: The easiest way to think of it from my perspective is like a post office, okay? I can go and I can see what might be out there, I can search, which is wonderful, and I can submit my application; I can mail my letter. And it'll then go to whoever it needs to go to. In reality we go pick it up from the post office. That was a big step forward for particularly state governments and specific organizations; especially the block and formula grant area. But the research community was harder, of course. First of all, it took a while to come up with a good data standard everyone could live with, that made a huge difference. But also the requirements didn't lend themselves as nicely to Adobe forums and things of that nature; the nature of the business. And while there are some institutions that [submit] to multiple science agencies, particularly like NSF and NIH; and NIH and NASA. There aren't a whole lot that [submit] to the same dozen research agencies. So I must always do energy-related research, so I might have something that I would submit to NSF but probably not Agriculture, right? So really the high volume, high transaction demands of the research community, and ease of use, and collaborative nature of how you work with people and prepare and help support that side of the process, Grants.gov was not as tuned to. So we've continued to run FastLane with endorsement and support from OMB, not because we don't want to use Grants.gov; we accept it from Grants.gov, or FastLane, and now through Research.gov. But it was for community gaps and inconsistencies with how it supported the community we serve. And so our proposals largely come in through FastLane and, of course; and Grants.gov has stayed with that. They just really do the find and apply. At one point it was going to be the reporting system for everybody; it's kind of stayed at find and apply. So there was a recognition

that at the time – this was four or five years ago – there was a recognition that, well, what are we going to do about Grants.gov? Is it going to become the one-stop shop for everything related to grants? Or are the missions, needs, etc. unique enough? And so there was this group called the Grants Management Line of Business; the next evolution of the e-gov initiatives. They went from initiatives to lines of business, so there's a Grants.gov that went to Grants Management Line of Business. There was the Financial System Activity; it went to Financial Management Line of Business. Human Resource; there're a bunch of little utility applications; they went to HR Line of Business. And Mary represented NSF and co-chaired that with someone with the Department of Education, at one point, and then from HHS.

Yost: These lines of business are interagency groups?

Norris: All interagency groups. So you go from FastLane – NSF was leader of the pack, ahead of the pack on that one – then you go to Grants.gov, which takes that electronic model and extends it to two small functions, but important functions; -- find and apply – for all grant making agencies, whether they are research or not. Now did that work? Can we just make that bigger, and bigger, and bigger, like what FastLane did, or do we have to think about this a different way? So they set up this Grants Management Line of Business; NSF and again it was like education, only then it was HHS co-chaired this under OMB's endorsement.

Yost: Do you remember what year that was?

Norris: Mary could tell you for sure. Where are we now; '11? – so this is probably like '05; 2005, 2006 probably; that's about where we are in time. But she can give you the exact timeline; I'd have to pull documents and sort through that. And so the model that was adopted working with all 26 grant making agencies was this consortia model; you know, one size will not fit all. It really does matter. It matters what capability you have; it also matters what community you're servicing and whether there's really common interests or requirements or not. Again, good lessons learned from FastLane that carry forward. We've been very vocal and played key leadership positions in all these activities from a variety of perspectives to reinforce those messages and lessons for them. So again, the people who did the early FastLane days had no idea what their experience; how it was going to really affect so much more than what they ever could have imagined. So anyway, there was this competition and at the end of the day, there were several consortially-selected for the grants family. So HHS was selected for Grants.gov, but also for another system that they did. It has to do more with the financial; the payment side. They wanted to take one of their agency-specific systems and extend it out to in particular, HHS agencies. NSF was selected for something that we called Research.gov, which was the modernization of FastLane by using a service-based architecture and a menu of services-type approach where we would provide a standard, more modern architecture and allow multiple research agencies to use or provide web service activities that met a business service that could be used by the research community. So we were the lead for the research community. HHS was the lead for extending out an established capability. And Education was selected; yet they were in a requirement stage and were

looking for partners and then we'll build a common thing. And that is what percolated for the next two or three years. And so Research.gov Mary and myself are the executive sponsors of that for the CFO or the OO for NSF it's the FastLane generation three, you know? So it is a modern technology architecture; commercial products as opposed to homegrown code at its core. So content management very visual, very media rich kind of capability. Service; web services-based architecture. We started with some high priority services. We've done it in partnership with some other agencies. And because it's service-oriented; so menu of services; you can partner on one service that works for you, but you don't have to do the whole thing and you're not wedded to the NSF way. And so this is where the beauty of the data standards that the hard work of these policy groups and policy players have done with technology. So we stayed away from find and apply. That would've been the logical place to start, okay? But what we did was at the time the Transparency Act [Federal Funding Accountability and Transparency Act of 2006] came out and there were some requirements to be much more transparent about where your dollars are going, what it gets. So the first service we did was research spending and results, which is a very nice capability to search on any award that we've made and you'll get the story all the way from the proposal, what the award summary is, who the PI is, the congressional district, the institution, all those things. If you've done it, whatever you've published under that award, and a link to some of the commercial [inaudible] science, whatever, and you can actually read the publication citation. When the America Competes Act came out 18 months, 20 months or so ago, we added another capability, which is the Project Outcomes Report, because we have to have public outcomes that the general public can understand. So the PI uses research spending and results for

Research.gov to submit their project outcomes. It's supposed to be very John Q Public-friendly. So you get the story all the way from here's what was proposed; here's what was awarded; here's what was published; here's what the publication was about; and here's the public version plus all the financial and logistical data. That was one of the first services we started with, and NASA partners with us on that.

Another service we partnered with Agriculture [USDA] their research arm. They had no way of doing status, so [with] FastLane we can log on and see what the status is. Then if you're a PI you can see what the assessment is, etc. So we needed to modernize that capability in FastLane. So we worked with Agriculture and they partnered with us on that for application status. Very similar to FastLane but much modern platform; it supports multi[ple] agencies and it was a big win because they only had paper process; they had nothing electronic. We just recently did, with our Legislative and Public Affairs, a very media-rich capability called C-Innovation, which shows in much more powerful visual ways; a lot of pictures that we have rights to, and the video, and media, and all of that that is related to really engage the public. Right now we're working on Research Performance Report, so there's a new data standard for that government-wide. NSF led the way just like we did for data. Now with that standard in place, we're going to deliver a service under Research.gov for that. We're in the requirement stage for that right now with multi[ple] agencies – that anyone can use. So, again, it's kind of the extension of; FastLane started very NSF-centric; it married NSF's process. That's the only process it works with in terms of our policy and process; lot of best practices in its development. Once it was in its deployment stage there was a lot of catch-up to do in terms of just

sustainability, and usability, improvements, little more enhancements, but you know, [the] bulk was done, leading to driving the innovation with technology for our internal staff; then leading to drive the innovation at the government-wide level and FastLane on steroids, as Research.gov, modern technology architecture in partnership with other agencies. So today we have a service under Research.gov. Now a lot of universities have commercial products that they use to support their own business processes, right? So like COEUS [?], and CAYUSE [?], and those; so the service now is the seamless web interface. So you fill out your application, your proposal, etc. etc.; you hit the button and it just goes to NSF. It doesn't have to go through FastLane; you don't have to go to Grants.gov; you don't even have know even Research.gov; it'll just go to us. So we have been working with the vendors now. Because really the end goal is that you don't ever have to leave your environment to come into the NSF or to a research agency. That's the administrative overhead; the administrative burden, right? If we can cut some of that down then it really is seamless. So that's where we're spending a lot of our energy. Now we've already done it with a couple different product lines and then we also have implemented the In Common, which allows you to use your credentials that you have at your institution, even if you don't have one of these business systems there, to come to NSF or wherever. So NIH is adopting this, certainly NSF has this; again, you don't even have to know the application anymore. We want to try and cut that down. It's an interesting evolution over really a very short window of time, when you think about it. You're talking, you know, what? Twenty years? And FastLane still is a work horse for us. This week is a very, very busy week for us. We've got huge panels that are meeting

actually off-site and we have huge deadlines for one of our CAREER programs, which is a multi-disciplinary program.

Yost: That's the biggest in terms of (pause)

Norris: Volume, yes. And so we're expecting I think it's 3,000 applications in the next two or three days. And these are, of course, people who might not be as experienced also, and so our Help Desk is going to be very busy. There's a lot of load on our system. We're down to the last three or four weeks of our end of processing the award decisions. And we have these huge panels off-site where we have like 1,000 people, for a couple days.

Yost: Is the Help Desk a constant size, or do you bring on additional [staff]?

Norris: So one of the things we did is we merge the two Help Desks. When I got here there were two Help Desks, and I would say really three. So we had a whole branch of people who basically fielded calls. We had eight separate contracts, separate senior people that FastLane calls and we have people who did anything else, right? Separate contracts; separate people. So we integrated that whole set of functions and awarded it to one, which was a very positive move for a variety of reasons. So number one, again, we still have suffered from this peak processing. So it was interesting, the IT Help Desk that did everything else had not really been, in my opinion, funded adequately; and had a very poor reputation. The FastLane helped us to have a very strong reputation, but was not as mature of a Help Desk operation. So they had automation, for example; they counted

calls by ticks on paper, things like this. This Help Desk had some automation so we blended the two and took some of the business dollars from some of the staff and you get the best of both. You get the tools, the discipline of how you actually do call centers, support work, and the dedication, knowledge, and commitment that you needed. So it allows for these peak days; we can shift people around so we don't find ourselves just in over our head on a busy day. And now we've got enough history [that] we can plan in advance. I mean, we're never surprised by these anymore. But in the early days, you know, still learning how this was all going to work. So we field about 100,000 calls a year, and about 50 percent still comes from the research community. And I keep thinking that those numbers are going to change. The nature of the calls have changed.

Yost: How would you think that they would change?

Norris: Well you think that if a system is reasonably intuitive to use, the community; it's still 2,000 universities. The PI population changes, right? So; and those are often people using it; but we also have heavy users from the institutions, as well.

Yost: Grant submissions are going up every year.

Norris: So grant submissions are going up. But we get a lot of experienced researchers, as well as new ones here. You would hope the system is getting more and more intuitive, or people are learning it more and more. So I wouldn't have expected it to stay flat. I would never have expected to drive it down to zero, but I would have expected a

declining trend. We just don't really see much of a declining trend; so I've always been fascinated by that. Now I have theories about it; I think the nature of what the calls are has changed. There's not a lot of anomalies in the software anymore. FastLane's been in a maintenance mode for years. Occasionally we'll do something and create a problem for ourselves; or there's something; technology just has its quirks, you know. But it's not changing a lot so it works pretty good; it's pretty predictable. So we run the numbers, I mean, literally, truly every day on how many calls we've gotten, what are the categories so we can look for trends, how long they're open, we have some very advanced technology for that. We can tell you how long you would wait on the phone before you hang up. We can tell you how many people sat for how long on the phone, if it's a busy day. All of those things. So a lot of them are core problems that I'm not sure will ever go away. Proposal preparation; someone's preparing a proposal and they just need some help. So we had 22 of those calls yesterday. Project report; so a lot of it's on the submission things. We distribute out password and account information because people may go a year or two without submitting anything so they forget their password a lot. So there's some things we'll do to make that a little easier. Today people have to call. So there's some logic to why the numbers would stay, but they still stay. This is our stuff; from the 11th through the 20th, ranged from 96 to 169 a day. And so, the Help Desk plays a key role. We have a very high what's called resolution with them. And I've got another report that shows the metrics on that. A very high percent are resolved on the phone.

Yost: In the early days of interagency work after FastLane was created, was there rivalry between different agencies?

Norris: Oh sure.

Yost: Okay, the 'not-invented-here type'?

Norris: Oh yeah, rivalry. Yeah, sure. There was a lot. NSF was the first to the game and had the best for the longest time. By the time all this e-gov and all these other things, we were always first but we weren't necessarily the best anymore. Technology had changed; you know, and there are NSF people here that would just roll over in their grave if they heard me say that. But I mean, that's the truth. In the intervening years a lot had happened. There were new technology approaches; there were new, jazzier, smarter capabilities; and so you had the people who had nothing and wanted something newer and glitzier. NSF FastLane was very NSF-centric so we really couldn't take NSF's FastLane and just add other agencies; it would not have worked. The system couldn't have withstood that. So what we promoted was the model of FastLane and hence, Research.gov. It's the moderate; learning all those lessons; learning all that; but leveraging all that into something new. OMB was not going to fund anything; you know, allow any new money to be spent; or even old money to be spent. This was the days of the red, green, yellow stoplight, you know, we'd just get smacked all around for that. So there were a lot of things going on. People who had no automated capability at all, anything that anyone would offer them at the government-wide level was better. And

then you had more mature, more complex kinds of agencies like NSF, who we would have been going backwards in a lot of situations, really no longer effectively supporting our community. Or there were certain agencies with such strong legislative; you know, competitive forces from all the different kinds of appropriations and earmarking, and things that they had that the kind of simple 'find and apply' was not going to be an adequate model for them. So there were a lot of those dynamics going on. The suspicion by everyone was that; the hope in the early days was that these government things was that we could focus on the reporting, so that you could assess performance, so that you could stop underperforming programs. So that's not always the best way to get people to come to a party if that's the end game, you know? (Laughs.)

Yost: Right.

Norris: So it was just very interesting. So this menu of services approach that we've done for Research.gov has actually worked very well for the research agencies, I think, because it's not a one-size-fits-all, you can partner on things that make sense to you. The further, deeper you get into the process, the closer you are to mission. And so at some point, it really doesn't make sense anymore to share the activity. So this was a lot of technology looking to create the efficiencies, which in certain areas I think it really did at the government-wide level. But at some point you kind of have to stop; you're no longer creating that efficiency. So, comparable example is we flipped over to a joint government-wide payroll system. We did our payroll on the second. Everyone doesn't have to run their own custom developed, highly expensive payroll system. That was

something we gladly rolled over. Start talking about our decision process about what we make decisions about what science to fund; that's a whole other discussion.

Yost: I heard some program officers that aren't thrilled with the travel system.

Norris: Yeah, well that's one of those things that no matter what they did on that, the world was going to be unhappy. We had no choice. (Laughs.) The DIS group is the one that supports that and what they've done is a really nice job. Not, of course, over the years; but it's gotten better. This is again one of these mammoth government-wide things that didn't go quite so nicely. In effect there's again; here was; really subsidized that whole activity with the travel staff function that kind of handholds and works through some of the government-wide system created for us. So again, NSF is usually pretty good about trying to, you know; so many of these things were winners; some were not. Grants.gov I think was a winner for what it intended to do. It was not without its source of problems, and challenges, and issues; and still to this day.

Yost: Am I correct in understanding that Grants.gov actually wasn't allowed to be used during the extra stimulus funding [ARRA] because it caused more challenges, took more time, and there was an overload on resources or was that tracked?

Norris: Mary is the best person to ask that because she can give you the official NSF position. She was really our lead on that, during that window of time. But Grants.gov had some capacity and performance issues. They were struggling with some of that and so

there was some experience -- and I don't know the specifics were – and also some just concern that with all the money and transactions coming through it wasn't going to work. And so some agencies were around to take some other courses of actions. So she's really the best person to talk to about that.

Yost: Okay. Moving back to E-jacket for a moment (pause)

Norris: Is this what you're interested in hearing about?

Yost: Yes, this is great. This, of course, is a major change to internal processes; the way things are done versus the paper-based days. Can you describe the infrastructure and the techniques that were used to get feedback from NSF staff [or] to get buy-in from NSF staff?

Norris: It's interesting. So we started with this E-jacket as a pathfinder. No one probably remembers that but it was supposed to be the pathfinder or the bridge between the old paper world and the new. That we could automate it, if you will; but would do it really quickly so we can then figure out how we could actually do the process better. You know, do it to the extent we can, as we go forward; but this is kind of important. So E-jacket was only supposed to have to have a relatively short window of time. Because of funding it stretched out to much longer.

Yost: Was it initially geared to be done for both declines and acceptances at the same time, or was that separate?

Norris: We had to cover that so what happened is, okay, there's not enough money to do it so you break it out of these. I mean, it was always intended to cover both. So the first tab forward was the declinations, because that's 70 percent [of submitted proposals] at the time. So do you solve the 30 percent that's a lot more complicated, or do you solve the 70? So that was the decision, the driver on the decision. But it took E-jacket did the acceptances or the approvals for – oh my gosh – I mean, it was four or five years, and it was supposed to truly be like 18 months or something. So there's a lot of big working groups.

You know, what are the best lessons from FastLane? So set up all kinds of user groups and working groups. With hindsight, the problems that I've seen that I think are lessons learned on E-jacket are we've never had a sponsor, okay? It was a group consensus, collaborative kind of activity and a lot of starting with what people knew. So here's the paper process; here's how I would automate it; here's how it should work. Everyone always says, well, could we do a little bit differently than that? I mean you ask that, but that's a very incremental improvement, generally. No one really stepped back and said, if we wanted to say here's the proposal that's now in NSF in electronic form, what *should* the process be or how *could* we do the process, knowing that we have this power of being able to do it in an electronic form. So [with] working groups, people come who have time; people come who have strong views; they may not come back to the same group;

you know, so there wasn't formal representation. Policy [and] general counsel [were] heavily involved, as they should be. But a lot of things in the development over all this time of E-jacket; policy says this but the way people actually do it may be quite different. And in a paper world it was a lot different. You could [say], could you take a look at this, or I need you to see this, or let's just run five copies of that. In an electronic world that's a much more; you have to think that process through in order to be able to accommodate it. And there wasn't a lot of consistency across the directorates. Nothing violently wrong, but a lot of subtle nuances [that] policy says this, we do this but it's in a very different way. And just working through that, the directorates really had never gotten together to even come up with a common way of doing things. And one of the downsides of E-jacket is because the accountability and authority truly sits with the Program Officer making recommendations, and the Division Director. Policy really held to that in the electronic system and so we got some pushback from folks. "I came here to manage over some science and I sit at that computer all day long and I process jackets."

And then we had a whole set of administrative staff who would help do a lot of that in the paper world, that the electronic world wouldn't accommodate anymore. And so the staff [inaudible] a lot of bugs, inflexible, it's terrible, it's, you know. There's some truth to that. But it was a lot of just strict automation of a policy-oriented paper process. In reality, this is what it does and how it works. And I think that's where we're at next. Now we're starting to say, okay, look, what really works here? So for example, if it doesn't work as well for collaborative or interdisciplinary kinds of proposal processing, internally, [it's] because the rules really weren't embroiled in all of that work a number of

years ago, so it actually makes it harder for people to do that. So we're going to be at that second generation on that as well. The capability will be reflected in Research.gov. Does that make sense?

Yost: Yes. Thank you so much.

Norris: Okay. Good.