

# **Project Completed by:**



VZP DIGITAL

American Trails  
Equestrian Trail Design and Best Practices  
from Backcountry to Urban Edge Settings  
Thursday, April 16, 2020  
10:00AM – 11:30AM Pacific

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> THANK YOU FOR JOINING US FOR OUR WEBINAR EQUESTRIAN TRAIL DESIGN AND BEST PRACTICES: FROM BACKCOUNTRY TO URBAN EDGE SETTINGS. THIS IS OUR 78TH WEBINAR IN THE AMERICAN TRAILS ADVANCING TRAILS WEBINAR SERIES. MY NAME IS CANDACE GALLAGHER. CLOSED CAPTIONING AND LEARNING CREDITS. CONTACT US VIA THE QUESTIONS BOX IN THE WEBINAR CONTROL PANEL IF YOU HAVE ANY QUESTIONS ON THOSE ITEMS THE FEDERAL HIGHWAY ADMINISTRATION, NATIONAL PARKS SERVICE AS WELL AS TODAY'S PRESENTERS WHICH INCLUDE HOLLEY GROSHEK, THE EXECUTIVE DIRECTOR WITH THE EQUINE LAND CONSERVATION RESOURCE. RANDY RASMUSSEN, THE DIRECTOR OF PUBLIC LANDS AND RECREATION WITH BACK COUNTRY HORSEMEN OF AMERICA. JIM COFFMAN, THE PRESIDENT OF COFFMAN STUDIO. JUSTIN AZEVEDO, WITH COFFMAN STUDIO AS WELL AS MATTHEW WOODSON, PRESIDENT AND FOUNDER OF OKANOGAN TRAIL CONSTRUCTION. I WILL NOW HAND THE CONTROLS TO HOLLEY TO GET STARTED.

> THANK YOU, CANDACE. AS ONE OF THE CO-ORGANIZERS OF TODAY'S WEBINAR, I WANTED TO TAKE A MINUTE TO INTRODUCE YOU TO MY ORGANIZATION EQUINE LAND CONSERVATION RESOURCE OR ELCR FOR THOSE NOT FAMILIAR WITH OUR ORGANIZATION, AND TO HIGHLIGHT THE FREE SERVICES WE PROVIDE TO THE EQUINE COMMUNITY. ELCR IS A NON-PROFIT EDUCATION-BASED ORGANIZATION. WE'RE THE ONLY NATIONAL ORGANIZATION DEDICATED TO CONSERVING LAND FOR ALL HORSE-RELATED ACTIVITY. OUR MISSION IS THE LEAD IN THE PROTECTION AND CONSERVATION OF LANDS FOR HORSES AND HORSE-RELATED ACTIVITIES. WE SUPPORT THE EFFORTS OF INDIVIDUAL, ORGANIZATIONS, AND COMMUNITIES WORKING TO ADVOCATE LOCALLY FOR EQUINE ACCESS TO LAND. WE DO THIS BY PROVIDING COUNSELING AND TECHNICAL ASSISTANCE AS WELL AS EDUCATIONAL RESOURCES AND PROGRAMMING LIKE TODAY'S WEBINAR THAT WE'RE

COHOSTING WITH OUR CONSERVATION PARTNERS AMERICAN TRAILS AND BACK COUNTRY HORSEMEN OF AMERICA. IF YOU GO TO OUR WEBSITE AT ELCR.ORG, YOU WILL FIND A SCREENSHOT OF OUR RESOURCE LIBRARY. FOR EXAMPLE, IF YOU'RE INTERESTED TO EQUINE ACCESS TO PUBLIC LAND, YOU WOULD SIMPLY PICK ON THE SECOND PICTURE OF THE TOP ROW AND THAT WOULD TAKE YOU INTO OUR RESOURCE LIBRARY AND ACCESS TO ALL THE EDUCATIONAL ARTICLES, TOOLS, TEMPLATES AND RECORDED WEBINARS PERTAINING TO THAT TOPIC AREA. SO IF YOU'RE FINDING YOURSELF A LITTLE BIT HOMEBOUND LATELY AND HAVE SOME TIME ON YOUR HANDS LIKE MOST OF US ACROSS THE COUNTRY, I REALLY ENCOURAGE YOU TO GO TO OUR WEBSITE, AGAIN ELCR.ORG, TO SEE WHAT'S AVAILABLE IN OUR WEBSITE AND OUR RESOURCE LIBRARY. WITH THAT, I'M GOING TO TURN THE PROGRAM OVER TO MY FRIEND RANDY RASMUSSEN WITH BACK COUNTRY HORSEMEN.

>> ALL RIGHT, WELL, THANKS SO MUCH, HOLLEY. I REALLY APPRECIATE THAT. AND AGAIN, MY NAME'S RANDY RASMUSSEN. I'M THE DIRECTOR OF PUBLIC LANDS AND RECREATION FOR THE BACK-COUNTRY HORSEMEN OF AMERICA. BIG THANK YOU TO AMERICAN TRAILS AND ELCR FOR THIS INVITATION. THEY INVITED US TO JOIN THEIR WEBINAR. SO I REALLY APPRECIATE THAT. AND RAINY YOU DON'T HAVE TO TAKE NOTES. IT'LL BE AVAILABLE IN A RECORDED WEBINAR. I WANT TO GET AN OVERVIEW. WE'RE A NATIONAL NONPROFIT SERVICE ORGANIZATION AND OUR VOLUNTEER TRAILS ARE OPEN AND ACCESSIBLE FOR EVERYONE. AND WE PRIMARY WORK ON PUBLIC LANDS AND IN THAT WAY WE'RE VERY COMPLEMENTARY WITH THE GOALS OF ELCR AND THE WORK THEY DO AND THERE'S A GREAT PARTNERSHIP THERE. WANTED TO LET YOU KNOW THAT YOU CAN READ THE STATISTICS FOR YOURSELVES ABOUT OUR VOLUNTEER HOURS OVER THE YEARS AND IN THE PAST YEAR. BUT REALLY WANTED TO POINT OUT IN THIS SLIDE SPECIFICALLY THE SERVICE AGREEMENTS, THE MEMORANDUMS AND UNDERSTANDING WE HAVE WITH THESE FOUR FEDERAL LAND MANAGEMENT AGENCIES. WHAT'S MISSING OF COURSE IS U.S. FISH AND WILDLIFE SERVICE AND WOULD LIKE TO HAVE A MOU WITH THAT ENTITY AS WELL. SO THAT GIVES YOU A BIT OF AN OVERVIEW. AND REALLY, OUR VOLUNTEERS, BCHA ARE ENGAGED IN STEWARDSHIP ACTIVITY WHICH INCLUDES TRAIL MAINTENANCE AND PARTNERSHIPS WITH LOCAL STATE AND U.S. PUBLIC LAND MANAGERS, IN ADDITION TO THE PARTNERS THAT WE'VE ALREADY SPOKEN ABOUT HERE IN THE INTRODUCTIONS, WE ALSO NAME TRAILS IN CONCERT WITH STATE PARKS DEPARTMENTS, THE PACIFIC WEST TRAIL ASSOCIATION, THE CONTINENTAL TRAIL COALITION, THE APPALACHIAN TRAIL THAT EQUINE USE IS ALLOWED AND THE PACIFIC NORTHWEST TRAIL, ARIZONA NATIONAL TRAIL AND MANY OTHER ENTITIES WE'RE ENGAGED IN PARTNERSHIPS. WANTED TO MENTION ALSO THAT OUR VOLUNTEERS ALSO ENGAGE IN EDUCATION. IT'S PART OF OUR MISSION, EDUCATING THE AGENCIES

AND EQUINE USERS ON SUSTAINABLE PRACTICES INCLUDING EQUINE LEAVE NO TRACE. OUR EDUCATION ALSO INCLUDES CROSS-CUT AND CHAINSAW TRAINING AND CERTIFICATION, YOUTH PACK CLINICS FOR LEARNING ABOUT THIS SPECIFIC -- BOTH AN ART AND A SCIENCE OF PACKING, AND THEN LASTLY, I WANTED TO MAKE SURE THAT OUR VOLUNTEERS FROM BACK COUNTRY HORSEMEN OF AMERICA HELP IN THE PRESERVATION OF WILDERNESS CHARACTER. THIS HAPPENS TO BE THE FIRE IN NORTHERN CALIFORNIA IN 2014. BUT BY USING HORSES AND MILES, WE CAN HELP FEDERAL LAND AGENCIES PRESERVE WILDERNESS CHARACTER BY PROVIDING PATH SUPPORT VIA PRIMITIVE MODE OF TRAVEL. AND IN THIS CASE, IT'S IN LIEU OF HELICOPTERS AND ATV'S. WHAT YOU WOULD SEE IN THAT SLIDE IS HELICOPTERS UP TO 12 SUPPLY TRIPS AND IN THIS CASE THERE WERE SEVERAL INVERSIONS THAT MADE FLYING UNSAFE. AND SO THE ONLY TRANSPORT IN AND OUT FOR MANY INSTANCES IN MANY DAYS WAS THE PACK SUPPLY. SO AGAIN, PRESERVING WILDERNESS CHARACTER PARTICULARLY AT TIMES WHEN TRAVEL AND TRANSPORT FOR EMERGENCIES LIKE THIS IS NOT EVEN POSSIBLE. I'M HAPPY NOW TO TURN IT TO OUR PRESENTERS WHO ARE ON THE CUTTING EDGE IN TERMS OF HOW TO PLAN, DESIGN, AND CONSTRUCT AND MAINTAIN USTAINABLE TRAILS. SO JUSTIN. I'M GOING TO GUESS EVERYBODY IS COMFORTABLY AT HOME IN THEIR WORK FROM HOME ENVIRONMENTS AT THIS POINT. SO HOPEFULLY EVERYBODY'S IN A COMFY SPOT AS WE GET STARTED TODAY. WE'LL DIVE IN TO EQUESTRIAN TRAIL BEST PRACTICES. FIRST OF ALL, WHO WE ARE AND WHY WE'RE ACTUALLY TALKING TO YOU TODAY. SO I'M WITH COFFMAN STUDIO. MY NAME IS JUSTIN AZEVEDO. I'M A REGISTERED LANDSCAPE ARCHITECT. I WORK IN THE SOUTHWEST.

>> I'M JIM COFFMAN AND A VISITING DIRECTOR OF THE UNIVERSITY OF ARKANSAS'S DEPARTMENT OF LANDSCAPE ARCHITECTURE.

>> THE MAJORITY OF OUR WORK THAT I WILL BE FOCUSING ON TODAY IS IN THE SOUTHWEST. THAT IS WHERE OUR FIRM IS FIRMLY ESTABLISHED AND REALLY THE -- FIELD. WE TRIED TO EXTRAPOLATE THEM TO REPRESENT A GLOBAL OR AT LEAST NATIONAL REPRESENTATION OF HOW WE CAN BE LOOKING AT TRAIL PLANNING AND DESIGN. SO HERE AT COFFMAN STUDIOS, SO WE HAVE FOUR REALLY MAIN PRINCIPLES OF TRAIL DESIGN THAT WE LOOK AT WHENEVER WE START ANY SYSTEM. SO WE'RE PARTICULARLY TALKING ABOUT EQUESTRIANS TODAY BUT IT RELATES TO ALL TRAIL DESIGN WHERE WE WANT TO FOCUS ON THE USERS, THE LOCATION, THE EXPERIENCE, AND THE ACCESS THAT WE PROVIDE WHENEVER WE'RE DESIGNING A TRAIL, WHETHER WE'RE JUST INSTALLING SOMETHING ALONG A WALK STRETCH OF AN URBAN ENVIRONMENT OR 40 MILES OF BACK COUNTRY TRAIL GOING TO IN, THESE ARE THE FOUR CORE PRINCIPLES THAT WE LOOK AT FOR HOW TO DEVELOP A

SUCCESSFUL TRAIL AND SUCCESSFUL TRAIL SYSTEM. SO EVEN THOUGH TODAY WE ARE TALKING MAINLY ABOUT EQUESTRIANS, WE WANT TO RECOGNIZE THE FACT THAT WHEN WE ARE LOOKING AT DEVELOPING A SYSTEM, THAT MOST OFTEN WHEN WE'RE LOOKING AT TRAILS, WE'RE LOOKING AT NOT JUST EQUESTRIANS, WE'RE LOOKING AT NOT JUST HIKERS OR BIKERS OR TRAIL RUNNERS. WE TEND TO BE LOOKING AT A MYRIAD OF USERS WHEN WE'RE TRYING TO DEVELOP ANY TYPE OF A TRAIL AND RECOGNIZING THE FACT THAT THIS IS ACTUALLY THE EXACT SAME TRAIL ABOUT 100 FEET APART FROM EACH OTHER. YOU CAN EVEN SEE HOW THE GROUND KIND OF MATCHES IN, WHERE WE HAVE ALL THESE USERS COMING TOGETHER AT ONE SPOT ON QUITE A FREQUENT BASIS. WE'LL TALK A LITTLE MORE ABOUT THE USERS AS WE MOVE THROUGH. THE LOCATION IS ALWAYS KEY AND IMPORTANT, WHETHER WE HAVE PEOPLE RIDING WITHIN THE CITY LIMITS, REALLY MORE IN AN URBAN OR SUBURBAN ATMOSPHERE, OR WE MIGHT BE ALL THE WAY OUT IN THE FAR BACK COUNTRY, BUT RECOGNIZING HOW WE IMPLEMENT TRAILS AND REALLY AN EQUESTRIAN SYSTEM THAT BEST BENEFITS THE USER AS PART OF THAT. AND THEN WE WANT TO FOCUS ON THE EXPERIENCE. THIS IMAGE MIGHT NOT SAY MUCH TO THE EXPERIENCE AT FIRST GLANCE, BUT THIS SAYS A LOT TO US AS WE TRY TO PLAN TRAIL SYSTEMS. CREATING THESE CONCEPTS OF LOOPS AND LOTS OF ACCESS POINTS TO GET INTO THE SYSTEM, WHICH REALLY THE EXPERIENCE AND THE ACCESS TEND TO START TO LEAD INTO EACH OTHER BECAUSE YOU CAN'T HAVE A GOOD EXPERIENCE IF YOU DON'T HAVE ACCESS. SO ACCESS IS REALLY ANYWHERE FROM LOOKING AT AN EQUESTRIAN TRAILHEAD TO A SIMPLE ENTRY NODE AND MAKING SURE THAT WE HAVE LOTS OF ACCESS TO THESE SYSTEMS. IT'S NOT JUST A ONE WAY IN, ONE WAY OUT OF TYPE OF SETUP. WE WANT TO MAKE SURE THAT WHENEVER WE START TO DEVELOP AN ENTIRE TRAIL SYSTEM, THAT WE REALLY START TO PROVIDE MULTIPLE ACCESS POINTS, MULTIPLE WAYS TO ACCESS AND ENSURE THAT IT'S OPEN TO AND CREATES REALLY THIS EQUITY OF TRAIL ACCESS.

>> AND YEAH, AND IT REPRESENTS IN THAT ONE SLIDE PARKING ACCESS AS WELL AS WALK-IN AND RIDE-IN ACCESS AND ANY LARGE SYSTEM IS A COMBINATION OF BOTH OF THOSE THINGS IN ORDER TO MAXIMIZE THE ABILITY OF THE PEOPLE TO GET TO THE SYSTEM.

>> YES. SO WE'RE GOING TO LOOK AT HOW DO WE SERVE THOSE PRINCIPLES. THOSE ARE ALL REALLY GRANDIOSE IDEAS AND CONCEPTS BUT DOESN'T DO GOOD UNTIL YOU GET INTO THE DETAILS. WE USE A TERM THAT EVERYBODY USES THESE DAYS, BUILDING A TOOLBOX. WE'RE JUST GOING TO GO OVER A VERY BASIC OUTLINE OF HOW WE TYPICALLY CREATE A TOOLBOX PARTS AND PIECES IN A KIT TO DEVELOP A SUCCESSFUL TRAIL SYSTEM WITH GOOD DESIGN BEHIND IT TO BACK IT UP. SO REALLY WHENEVER WE BUILD A TOOLBOX THAT'S

BASED ON A TRAIL SYSTEM, WE NEED TO LOOK AT A TRAIL HIERARCHY, AND WE'LL DIVE INTO EXACTLY WHAT THAT MEANS, BUT GIVING A RANGE OF STYLES OF TRAILS IS REALLY IMPORTANT. IT'S REALLY HARD TO USE TRAILS IF YOU DON'T HAVE THESE SUPPORTING ELEMENTS THAT MIGHT GO WITH IT. WE'LL SHOW YOU EXAMPLES OF HOW YOU UTILIZE THE TRAIL HIERARCHY AND SUPPORTING ELEMENTS TO BUILD SOMETHING THAT CAN BE SUCCESSFUL IN YOUR COMMUNITY. THIS IS JUST A QUICK SNAPSHOT OF A RECENT TRAILS PLAN THAT WE COMPLETED FOR THE CITY OF GOODYEAR, ACTUALLY BUCKEYE, I APOLOGIZE. THIS WAS LOOKING AT HOW DO WE DEVELOP URBAN TRAILS THAT REALLY ARE TOUCHING CLOSER INTO THOSE DOWNTOWN TOURS WHERE PEOPLE ARE OFTEN WALKING WHERE MIGHT NOT BE THE MAIN USERS BE A SHOULDER THAT'S ATTACHED THAT'S AT LEAST FOUR FEET WIDE FOR EQUESTRIANS, JOGGERS THAT WANT TO USE, BUT IT PROVIDES ACCESS AS MUCH AS POSSIBLE. THAT LEADS US INTO TRAIL ACCESS. THESE ARE THESE WIDE ACCESSIBLE TRAILS. THEY'RE OFTEN ADA ACCESSIBLE AS WELL. YOU SEE THESE IN MORE RURAL ENVIRONMENTS OR THE VERY BEGINNING OF A FRONTCOUNTRY TRAIL SYSTEM. THEY ALLOW FOR EMERGENCY ACCESS. SO THAT MIGHT MEAN WE HAVE A UTV DRIVING DOWN IT THAT MIGHT BE PART OF A CITY ENTITY OR MAINTENANCE PROGRAM THAT ALLOWS ACCESS AT LEAST THROUGH THE FIRST PORTION OF FRONTCOUNTRY OR ACCESS OFF OF TRAILHEADS. AND THEN WE LOOK AT PRIMARY TRAILS. THIS IS MORE THE TYPICAL TRAIL YOU SEE EVERYWHERE IT. TENDS TO BE SOMEWHERE BETWEEN THREE TO FIVE FEET WIDE. GETS A LITTLE WIDER SYMPTOMS. WE HAVE FRONTCOUNTRY TRAILS, WHICH IS REALLY WHERE WE START TO REMOVE OURSELVES FROM AN URBAN ENVIRONMENT BUT THESE TEND TO GO ALONG MAYBE MAJOR UTILITY CORRIDORS OR ACCESSING THESE SMALLER NATURE PRESERVE AREAS. AND THEN MOVING INTO BACKCOUNTRY TRAILS WHERE WE TRULY ARE INTO THE BACKCOUNTRY. AND THEN SUMMIT TRAILS WHERE THESE TEND TO BE THE MOST PRECARIOUS AND GOING UP A SUMMIT, SO THEY TEND TO HAVE A STEEP GRADE AND FAIRLY NARROW TRAIL WIDTH. AND THIS IS JUST A SNAPSHOT OF WHAT WOULD BE SUPPORTING ELEMENTS OF DEVELOPING A TRAIL SYSTEM. THERE'S A LOT OF THINGS THAT REALLY GO INTO EACH AND EVERY ONE OF THESE. WE COULD PROBABLY GIVE AN ENTIRE WEBINAR BASED ON JUST EACH ONE OF THESE AND HOW TO DEVELOP THEM CORRECTLY. BUT WE WANT TO LOOK AT HOW PEOPLE ARE CROSSING IN URBAN ENVIRONMENTS, AT-GRADE CROSSINGS, OVERPASSES, UNDERPASSES, ACCESS POINTS, TRAILS AND NODES, BRIDGES. BRIDGES TEND TO FOCUS MORE ON CROSSING POTENTIALLY WATERWAYS OR LARGE CANYON WASHES, THINGS IN THAT LINE OF SIGHT. AND THEN THERE'S ALSO SIGNS AND WAYFINDING. IT MAKES IT HARD TO USE THE TRAIL SYSTEM IF THEY DON'T NO HOW TO GET TO IT. SIGNS AND WAYFINDING ARE THINGS WE REALLY FOCUS ON IN TERMS OF DEVELOPING SOMETHING THAT'S HIGHLY SUCCESSFUL.

>> AND THESE WILL BE ELEMENT THAT IS SUPPORT BASICALLY THE LINES ON THE MAP. IF YOU'VE GOT THE HIERARCHY OF TRAILS, IT'S THESE ELEMENTS THAT REALLY MAKE THE SYSTEM MORE USABLE, SAFER, MORE COMFORTABLE. IT REDUCES CONFLICTS AND RESTRICTIONS AND IT REALLY--WE THINK IS KIND OF A MAIN THING THAT REALLY MAKES A SUCCESSFUL TRAIL SYSTEM. THIS IS AN EXAMPLE OF AN URBAN TRAIL HERE SOMEWHERE IN THE PHOENIX AREA. IT'S A SIDEWALK AND IT HAPPENS TO HAVE A LARGE SHOULDER THAT ALLOWS FOR EQUESTRIAN USE. AS YOU'LL PROBABLY SEE AS YOU LOOK DOWN THE TRAIL A LITTLE WAYS, WHEN WE WORK WITH URBAN ATMOSPHERES, WE TEND TO BE TRYING TO MAXIMIZE WHATEVER WE MAY HAVE ACCESS TO. SO THIS IS A PRIME EXAMPLE OF WE DID NOT ACTUALLY RECEIVE THE CLEARANCE THAT WE MIGHT WANT AS PART OF THIS TRAIL WITH THE TREE LEANS OUT OVER REALLY THE EQUESTRIAN PORTION OF THIS MULTIUSE FACILITY BUT WHAT WE'RE TRYING TO DO IN URBAN IS FIT THE FACILITIES HOWEVER WE CAN WHEREVER WE CAN BECAUSE WE'RE MOST OFTEN COMING BACK AND RETROFITTING SOMETHING TO FIT WHERE IT MIGHT NOT HAVE BEFORE. IT'S KEY TO HAVE SIGNAGE AND WAYFINDING PARTICULARLY IN THE URBAN ATMOSPHERE WHERE WE WANT TO SHOW HOW DO YOU YIELD, MAKE PEOPLE AWARE THAT HORSES DO BELONG HERE, THAT PEOPLE WALKING AND BIKING ALL BELONG IN THE SAME FACILITY AND WHO TO WATCH OUT FOR AND WHY.

>> IN THIS CROSS SECTION, WE'VE ENDED UP USING THIS IN A LOT OF COMMUNITIES AROUND HERE BECAUSE IT ADDRESSES TWO DIFFERENT SURFACE TYPE THAT THEREFORE ADDRESS EVERY TYPE OF USERS THAT WE CAN CONCEIVE OF USING THE SYSTEM AND WE OFTEN HAVE FAIRLY RESTRICTED RIGHT OF WAY AND NARROW SPACES TO FIT EVERYTHING IN. SO THIS PICTURE IS A PERFECT EXAMPLE OF THAT. WE ACTUALLY HAD THE RIGHT OF WAY BUT THE NEIGHBORHOODS ADJACENT WERE VERY SENSITIVE TO THEIR LANDSCAPING AND DID NOT WANT THAT REMOVED. SO WE DID MOST OF WHAT WE COULD AND WHAT WE DID KIND OF ODDLY AND DIFFERENTLY IN THIS PICTURE IS WHERE THAT BRANCH DOES CROSS OVER THE DECOMPOSED GRANITE PORTION OF THE TRAIL, THERE'S A SURFACE ADDED TO THE SIDEWALK THAT ADDS A TEXTURE AND NONSLIP SURFACE TO EQUESTRIANS WITH MOVE OFF THE SIDEWALK TO AVOID THE TREE BECAUSE THE NEIGHBORS DID NOT WANT THE TREE REMOVED OR TRAILED. IT'S A PERFECT EXAMPLE OF WE HAVE TO MAKE DO AND COME UP WITH DIFFERENT SOLUTIONS WHEN WE HAVE UNIQUE CIRCUMSTANCES.

>> EXACTLY. AND THEN THIS ALSO -- THIS IS A RATHER UNIQUE SITUATION WHERE THERE IS A LARGE EQUESTRIAN NEIGHBORHOOD THAT HAPPENS TO BE ON THE WRONG SIDE OF THE FREEWAY, I THINK IS WHAT WE'LL SAY. SO IT IS ON

THE OPPOSITE SIDE OF THE FREEWAY FROM ONE OF THE LARGEST CITY-OWNED PRESERVES IN ARIZONA. SO UNFORTUNATELY, THAT WAS BLOCKING ALL ACCESS FOR EQUESTRIANS TO SAFELY TRAVEL FROM ONE SIDE OF THE FREEWAY TO THE OTHER. SO THIS PROJECT HERE WAS ACTUALLY DEVELOPING AND DESIGNING AN EQUESTRIAN-SUITABLE OVERPASS. SO AS YOU'RE LOOKING AT THIS, IT'S KIND OF HARD TO SEE ALL OF THE DETAIL, BUT REALLY THIS BRIDGE WAS FOCUSED ON CREATING THE MOST SAFE AND COMFORTABLE ENVIRONMENT FOR A HORSE TO CROSS AS WE COULD. SO IN CLOSING THE SPACE, ATTEMPTING TO ELIMINATE AS MUCH NOISE AS POSSIBLE, THE EQUESTRIAN TRACK IS ACTUALLY LOWER THAN THE PEDESTRIAN BICYCLE PATHWAYS ON EITHER SIDE OF THAT CENTER WHERE YOU SEE THOSE BARRIERS. THE GOAL IS TO GET THE HORSE DOWN AND INTO THE CENTER OF THIS FACILITY WHILE STILL KEEPING IT WIDE AND COMFORTABLE ENOUGH TO WHERE IT STARTS TO ELIMINATE SOME OF THE VIEW OF THE TRAFFIC AND THE FAST MOVEMENT ON THE SIDES, BRINGS A LITTLE MORE COMFORT WITH THE CEILING, TRYING TO KEEP AN OPEN VIEW TO THE CORRIDOR BEYOND THOUGH IS REALLY KEY AND IMPORTANT. SO YOU CAN SEE THE TREES AT THE END OF THIS ALLOWING THE SAFE SIGHT LINE, TRYING TO DEVELOP SOMETHING THAT REALLY IS AS COMFORTABLE AS POSSIBLE AND THEN ALWAYS HAVING THOSE TEXTURED TREADS. THERE'S LOTS OF SIGNAGE ON EITHER SIDE OF THESE, HOW TO USE IT, WHY TO USE IT. I THINK JIM MIGHT HAVE SOMETHING TO ADD AS WELL.

>> AT THIS POINT, THE NEIGHBORHOOD IS KIND OF TRANSITIONING AND THAT IS NOT THAT MUCH EQUESTRIAN TRAFFIC ANYMORE, BUT IT STILL FUNCTIONS AS A SHARED-USE OVERPASS OVER WHAT IS ABOUT A TEN-LANE OR AT LEAST AN EIGHT-LANE FREEWAY BELOW THIS. SO IT WAS A REALLY GOOD THING FOR THE COMMUNITY TO DO THIS AND I THINK EVEN JUST FROM A PLANNING POINT OF VIEW, THIS SHOWS THAT THERE'S A COMMITMENT TO THE PRESERVATION OF AN EQUESTRIAN LIFESTYLE IN A COMMUNITY AND WE'LL DO THESE IMPROVEMENTS TO TRY TO MAINTAIN IT. SO IT WAS A REALLY GOOD GESTURE ON THE PART OF THE CITY. THIS IS THE CITY OF SCOTTSDALE.

>> AND THEN WE START TO MOVE INTO RURAL SETTINGS. THIS ISN'T NECESSARILY PART OF THE TITLE OF THE PRESENTATION BUT IT'S SOMEWHERE IN BETWEEN. WE WANT TO LOOK AT AS WE MOVE OUT OF WHAT WE WOULD CALL URBAN EQUESTRIAN SETTINGS, MOVE INTO MORE OF A RURAL ATMOSPHERE TO WHERE THIS ISN'T COMPLETELY RURAL BUT A GOOD EXAMPLE OF A NICE CLEANLY IMPLEMENTED SYSTEM WHERE THIS IS SOMEWHERE IN BETWEEN A SUBURBAN DEVELOPMENT AND REALLY HITTING MORE INTO A RURAL ATMOSPHERE WHERE WE WANT TO BE SHOWING THE FACT THAT HAVE THIS WIDE PAVED ACCESS TRAIL WHERE IT IS ABOUT EIGHT FEET



WIDE ALL THE WAY THROUGH. IT'S CONSIDERED ADA ACCESSIBLE. IT FUNCTIONS BOTH AS A SIDEWALK AND AS A FACILITY FOR REALLY ANYBODY AND EVERYBODY TO USE. SO IT'S NOT FOCUSED ON JUST HORSES, EVEN THOUGH WE GET TO HAVE A HORSE TRAIL SIGN THERE BECAUSE IT'S PART OF THE DESIGNATED TRAIL SYSTEM FOR HORSES IN SCOTTSDALE. WE DO WANT TO LOOK AT HOW WE ACTUALLY IMPLEMENT THESE WITHIN THE ROADWAY. ONE OF THE KEY THINGS TO NOTICE HERE IS THE SPACING AND SOME OF THE VERTICAL ELEMENTS WHICH WE USE TREES AS MUCH AS WE CAN TO SEPARATE OUT AND CREATE A BARRIER BETWEEN THE EQUESTRIAN TRAFFIC AND THE MOTORIZED VEHICULAR TRAFFIC. THAT JUST CREATES MORE OF A SENSE OF COMFORT. THAT WAY WHEN YOU HAVE SOMEBODY THAT DECIDES 65 MILES AN HOUR DOWN THIS ROAD, THAT YOU DON'T HAVE THIS RATHER LARGE, QUICK AND APPROACHING VEHICLE SCARING A HORSE. WE WANT TO PROVIDE AS MUCH BUFFER AND SPACE AS POSSIBLE BETWEEN THOSE TWO USES. AND THEN WE START TO DIVE INTO MORE FRONTCOUNTRY TRAIL SYSTEM. HERE AT LEAST IN THE SOUTHWEST AND ARIZONA IN PARTICULAR, A LOT OF OUR INITIAL FRONTCOUNTRY TRAILS TEND TO ACTUALLY BE ALONG SOME MAJOR UTILITY CORRIDORS OR MAYBE A PAST DIRT HIGHWAYS OR WAGON TRAILS. THEY TEND TO BE UTILIZING EXISTING FACILITIES AS MUCH AS POSSIBLE. SO YOU CAN SEE THIS ONE IS ACTUALLY GOING DOWN A POWER LINE CORRIDOR BECAUSE IT'S EASY, IT'S ACCESSIBLE AND TENDS TO BE REALLY THAT FIRST STEP IN A LOT OF PLACES WHERE YOU'RE GOING FROM A RATHER DEVELOPED URBAN RURAL SETTING OUT INTO A FRONTCOUNTRY AREA. IT WILL BE THE FIRST CONNECTOR. IT'S WIDE OPEN. WE ATTEMPT NOT TO PUT THE TRAILS RIGHT UNDERNEATH THE POWER LINES BECAUSE YOU NEVER KNOW, YOU MIGHT FEEL THE BUZZ IN THE REINS AS YOU'RE WALKING DOWN. BUT WE WANT TO PROVIDE AS COMFORTABLE A SETTING AS POSSIBLE. THIS ONE IS ACTUALLY TAKING ADVANTAGE OF A PORTION OF AN OLD UTILITY ACCESS. SO IT GETS A LITTLE WIDER THAN FOUR FEET. TRAILS ARE ANYTHING BUT CONSISTENT WHEN WE'RE TALKING ABOUT TRAIL WIDTH, BUT THIS IS WHAT WE'RE STARTING TO LOOK AT WHEN WE DIVE INTO FRONTCOUNTRY. AND THEN LOOKING AT ACCESS TRAILS, SO THIS ONE WE'RE ACTUALLY GOING TO TALK A LITTLE BIT ABOUT AN ACCESS, THE VERY END OF THIS PRESENTATION. BUT LOOKING AT THESE WIDE OPEN TRAIL ACCESS FACILITIES THAT THIS IS COMING DIRECTLY OFF OF A TRAILHEAD. THIS IS A RATHER LARGE VERY HEAVILY USED TRAILHEAD, SO WE MAKE SURE THERE'S A REALLY BIG LARGE TRAIL THAT ALLOWS ACCESS IN AND ALLOWS SAFE PASSAGE FOR PEOPLE AND BIKES ALL STARTING TO CONVEIN IN ONE PLACE, THAT WE MAKE IT AS SAFE OF AN ENVIRONMENT AS POSSIBLE AND COMFORTABLE. ALSO, SIGNAGE AND WAYFINDING, THIS IS WHERE WE STEP DOWN A LITTLE BIT IN SIGNS. BACKCOUNTRY TRAILS HAVE THIS TYPE OF SIGNAGE. THIS IS A PACKAGE WE DEVELOPED FOR THE CITY OF BUCKEYE FOR THEIR SKYLINE REGIONAL TRAILS PARK, WHICH I BELIEVE NOW HAS -- I THINK

WE HAVE OVER 30 MILES OF TRAILS DEVELOPED WITHIN THIS PARK. IT'S A RATHER LARGE PARK. BUT WE HAVE THESE SMALL SIGNS THAT TELL YOU HOW LONG THE TRAIL IS, HOW DIFFICULT THE TRAIL IS. THIS IS IMPORTANT. WE'LL TALK ABOUT IT A LITTLE MORE LATER THOUGH. AND THEN WE START INTO BACKCOUNTRY WHERE WE START TO HAVE THESE TWO TO THREE-FOOT-WIDE SMALL REALLY SINGLE-TRACK TRAIL USES WHERE IT IS REALLY STARTING TO GET INTO MORE OF A STEEP SLOPE. THEY TEND TO BE KIND OF REMOVED FROM THE CITY HOPEFULLY AT THIS POINT AS WE LOOK AT TRANSITIONING OUT FROM THE URBAN EDGE. THIS IS ACTUALLY A REALLY IMPORTANT THING WHEN WE LOOK AT SOME OF OUR PLACEMENT OF TRAILS. WE PLACE TRAILS WHERE YOU DON'T HAVE VIEWS OF THE CITY OR URBAN DEVELOPMENT BECAUSE A LOT OF PEOPLE ARE TRYING TO GET AWAY FROM THAT. WE CAN TALK MORE ABOUT THAT IN LOCATIONS LATER. AND THEN SUMMIT TRAILS. THESE TEND TO BE THE MOST DIFFICULT. THEY TEND TO HAVE A LITTLE BIT OF ROCKS. THE ONE THING WE DIDN'T TALK ABOUT MUCH YET IS HOW A LOT THESE TRAILS TEND TO BE SELF-SELECTING ON WHO'S USING THEM. AS I'M SURE YOU CAN SEE AS WE MOVE THROUGH A NUMBER OF THESE, THERE ARE SOME TRAILS THAT WOULD BE OBVIOUS THAT EQUESTRIANS MAY WANT TO RIDE ON MORE THAN OTHERS. THIS MIGHT BE AN EXAMPLE OF SOMETHING THAT A LOT OF EQUESTRIANS MIGHT NOT WANT TO USE BUT SOME EQUESTRIANS MIGHT WANT THE CHALLENGE OF. AS YOU CAN SEE AGAIN WE TRY TO BRING IN NATURAL TREAD WITH SOIL, TRYING TO AVOID ROCKS AS MUCH AS POSSIBLE. BUT THEY TEND TO HAVE THESE REALLY TIGHT NARROW AREAS, FAIRLY STEEP TERRAIN. SO LOOKING EXACTLY WHAT THE COMFORT RANGE IS WITHIN THESE IS IMPORTANT AS WELL.

>> AND EVEN JUST CREATING THE IDEA OF A SUMMIT TRAIL, IT'S PRETTY CRITICAL TO WHEN WE'VE DONE THESE LARGE OPEN SPACE KIND OF PRESERVE TRAIL SYSTEMS. THE MOST POPULAR TRAIL IN THE STATE OF ARIZONA OUTSIDE THE GRAND CANYON AWAY, IS THE PIESTEWA PEAK SUMMIT TRAILS. WE TRY TO IDENTIFY THESE SUMMIT OPPORTUNITIES AND THEY ARE USUALLY ALSO THE MOST SENSITIVE SITES TO BUILD IN THAT TAKE THEREFORE A NARROWER TRAIL AND A LOT OF SITE SPECIFICITY AND DESIGN WORK TO MAKE IT RIGHT.

>> WHICH MATT WILL TALK A LOT TOO FURTHER ON IN THE PRESENTATION AFTER WE HAND OFF THE BATON. SO NOW WE WANT TO TALK A LITTLE BIT MORE ABOUT THE EXPERIENCE. SO WE TALKED ABOUT KIND OF HOW YOU MIGHT DEVELOP A SIMPLE TRAIL SYSTEM AND IDENTIFYING THE DIFFERENT USE OF THE HIERARCHY, WHAT SUPPORTING ELEMENTS MAY GO WITH THOSE. BUT WHAT ABOUT THE EXPERIENCE YOU HAVE WHEN USING THE TRAIL? WE THINK THIS IS REALLY IMPORTANT IN GETTING PEOPLE OUT TO USE THESE SYSTEMS, ESPECIALLY SINCE WE TEND TO BE PUTTING A LOT OF DOLLARS INTO

THE DEVELOPMENT OR A LOT OF TIME INTO THE DEVELOPMENT OF THESE TRAILS. WE WANT TO MAKE SURE THAT WE'RE CREATING THE BEST EXPERIENCE POSSIBLE AND DRAWING NOT ONLY THE RIGHT PEOPLE BUT DRAWING THE RIGHT AMOUNT OF PEOPLE. SO WHAT WE WANT TO THINK ABOUT IS REALLY HOW DO WE PLACE THOSE TRAILS. SO WHERE IS THE LOCATIONS BEING PLACED? JIM TALKED A SECOND AGO ABOUT DESTINATION AND HOW DESTINATION IS REALLY A KEY PART OF HOW TO DEVELOP A SUCCESSFUL SYSTEM. AND THEN WE WANT TO TALK ABOUT THE DIFFICULTY OF TRAILS AND THAT MIGHT RANGE FROM STEEPNESS TO ACTUALLY LOCATION AGAIN AND WE WANT TO TALK ABOUT REALLY SAFETY AND COMFORT WITHIN A TRAIL AND WHAT IT MEANS TO BE SAFE AND COMFORTABLE. HERE YOU CAN SEE WHERE WE'RE ACTUALLY JUMPING BACK A LITTLE BIT TO THERE'S OUR FRONT COVER PHOTO. WE TALKED ABOUT THIS TRAIL FOR A MINUTE EARLIER IN THE URBAN SETTING. BUT WE WANT TO MAXIMIZE OPPORTUNITY. SO THIS IS A GREAT EXAMPLE OF MAKING DO WITH WHAT WE HAVE IN A FAIRLY URBAN SETTING AND HAVING THE TRAIL REALLY ATTACHED TO A SIDEWALK. MAYBE NOT THE MOST IDEAL CIRCUMSTANCES BUT IT WORKS AND IT PROVIDES A FUNCTIONING FACILITY. TO MOVING TO WHERE WE HAVE A TRAIL THAT FOLLOWS ALONG A DEVELOPED ROADWAY CORRIDOR. THIS IS A VERY RURAL SETTING. BUT IT DOES GO ALONG THIS PORTION OF THE ROADWAY QUITE CLOSE. THERE'S NOT A LOT OF DEGREE OF SEPARATION BETWEEN THE TWO FACILITIES FOR THE MOTORIZED AND EQUESTRIAN TRAFFIC. AND YOU CAN SEE LATER ON IN THE SAME CORRIDOR ON THE RIGHT-HAND SIDE, WE HAVE A MUCH MORE SEPARATED TRAIL, WHERE ACTUALLY THE TRAILS MOVE TO FOLLOW MORE OF THE POWER LINE CORRIDOR AND THE SEPARATION FROM THE ROADWAY ABOUT 15 TO 20 FEET.

>> AND ONE THING WE FOUND IN THIS AREA, THERE'S A LOT OF EQUESTRIAN PEOPLE IN THIS NEIGHBORHOOD. AND YOU WOULD THINK MAYBE A TRAIL SHOULD ONLY BE THREE TO FOUR FEET WIDE BECAUSE IT'S A VERY LOW-DENSITY AREA, BUT WE FOUND THAT THE WIDER THE TRAIL, THE MORE COMFORTABLE MORE PEOPLE ARE TO USE IT. IT EASILY ACCOMMODATES PEOPLE GOING BACK AND FORTH IN EITHER DIRECTION AND ALSO PROVIDES A BIT OF CLEARANCE SO THAT YOU CAN FEEL SAFE FROM CRITTERS THAT MIGHT BE IN THE VEGETATION OFF TO THE SIDE. AND I THINK IT JUST MAKES A MORE PLEASANT PLACE FOR PEOPLE TO WALK AS WELL AS A NICE PLACE TO RIDE A HORSE.

>> YEAH, EXACTLY. AND THEN AGAIN, MAXIMIZING OPPORTUNITIES. THIS IS WHERE WE'RE LOOKING AT DEVELOPING ALONG A POWER LINE CORRIDOR VERSUS HAVING A TRAIL SYSTEM THAT WE HAPPEN TO HAVE ACCESS TO THIS WIDE-OPEN NATURAL PRESERVE SPACE. SO WE REALLY WANT TO LOOK AT

HOW DO WE USE IT AND HOW CAN WE TAKE ADVANTAGE OF IT. ON THE LEFT-HAND SIDE, OBVIOUSLY WE'RE MOVING BACK DOWN A POWER LINE CORRIDOR. WE'RE UTILIZING EXISTING FACILITIES. AND ON THE RIGHT-HAND SIDE, THAT WAS AN OLD OFF-HIGHWAY VEHICLE TRAIL AND IT'S JUST A SPIDER WEB TRAIL THAT HAPPENED TO EXIST OUT HERE BEFORE THE DOL HANDED THE LAND OVER. AND A LARGE PORTION OF THIS ROADWAY IS BROUGHT IN AND CONVERTED TO A TRAIL. IT HAS A LITTLE BIT NARROWER TRAIL WIDTH BUT IT HAS THIS BEAUTIFUL ACCESS MOVING OUT INTO THE MOUNTAINS AND UTILIZING WHAT YOU HAVE WHERE YOU HAVE IT I THINK IS THE MOST IMPORTANT PART. AND THEN AGAIN, WE'VE TALKED TO THIS A LITTLE BIT. WE WANT TO FOCUS ON IT FOR JUST A SECOND. BUT LOCATION AND MAXIMIZING OPPORTUNITIES. IF YOU HAVE THE RIGHT OF WAY AND THE ABILITY TO MOVE, WHETHER IT'S A 10 TO 12 FOOT WIDE TRAIL OR IF YOU HAVE A SIDEWALK AND A TRAIL ATTACHED, IF YOU CAN SEPARATE OUT THAT MOTORIZED AND NON-MOTORIZED VEHICULAR TRAFFIC ON THESE TRAIL SYSTEMS, IT REALLY DOES HELP TO ENCOURAGE PEOPLE TO ACTUALLY GET OUT AND USE THEM. WE SEE A LARGE BUMP IN USAGE WHEN AS SOON AS WE'RE ABLE TO GET PEOPLE OFF OF REALLY THE BACK OF CURVE WITH JUST A FEW FEET AWAY FROM MOVING TRAFFIC AND MOVING THEM AN ADDITIONAL 10 TO 15 FEET AWAY IF WE CAN FROM THOSE VEHICLES TO PROVIDE JUST A SAFER KIND OF REALLY A BUFFER ZONE, A LANDSCAPE BUFFER ZONE WHERE WE PROVIDE AGAIN THESE TREES CREATING THESE VERTICAL SEPARATION ELEMENTS AND SHRUBS THAT SEPARATE OUT THE SPACE AN GIVE YOU A LITTLE BIT OF PLANTS WHILE STILL ALLOWING SIGHT LINES TO REMAIN OPEN WHICH IS KEY. YOU WANT TO SEE THE ROAD BUT IT'S NICE TO HAVE ELEMENTS THAT DIVIDE YOU FROM IT.

>> THE BUSIER AND HIGHER TRAFFIC AND FASTER THE SPEED OF VEHICLES ON THE ROAD, THE FURTHER THE SITUATION YOU WANT. SO IT REALLY RELATES DIRECTLY TO ROADWAY CLASSIFICATION AND TRYING TO MAKE THAT SEPARATION FROM THE TRAIL TO THE ROAD.

>> EXACTLY. AND THEN DESTINATION. SO WHERE DO YOU WANT TO GO? SO WHEN WE'RE TALKING ABOUT DEVELOPING ANYWHERE FROM A BACKCOUNTRY TO A RURAL SYSTEM, OFTENTIMES WE WANT TO GET TO THE SUMMITS, AS JIM WAS TALKING ABOUT. THAT TENDS TO BE THE MOST POPULAR TRAILS THAT ARE OUT THERE ARE PLACES THAT HAVE THESE LARGE-SCALE DESTINATIONS, WHETHER IT'S THE PEAK OF A MOUNTAIN OR WE'VE REACHED A WATER FALL OR EVEN JUST REACHING A CREEK OR SOMETHING UNIQUE TO THE AREA, ROCK FORMATION. CONNECTING THESE DESTINATION POINTS ARE REALLY IMPORTANT TO CREATING A TRAIL SYSTEM THAT IS USED AND UTILIZED AT AN APPROPRIATE LEVEL. BUT WE ALSO WANT TO LOOK AT ON THE RIGHT-HAND SIDE HERE AT THE HITCHING POST SALOON, PEOPLE DON'T

ALWAYS WANT TO JUST GO OUT AND RIDE OUT INTO THE MIDDLE OF NOWHERE. WE STILL WORK WITH A NUMBER OF TOWNS AND CITIES ACROSS THE STATE THAT STILL ARE REALLY FOCUSED ON PROVIDING ACCESS FOR EQUESTRIANS TO USE THESE FACILITIES. THIS JUST HAPPENS TO BE ONE OF MY FAVORITE LITTLE SPOTS WE'VE STOPPED AT ALONG THE WAYS IN SOME OF THESE TRAIL PLANS WE'VE DEVELOPED. BUT THIS TOWN, THEY JUST BUILT A MASSIVE NEW GROCERY STORE THAT'S IN THE HEART OF DOWNTOWN AND PART OF THE DEVELOPMENT REQUIREMENTS FOR THAT NEW GROCERY STORE GOING IN WAS THEY HAD TO HAVE A HITCHING RAIL AND A SAFE PLACE FOR EQUESTRIANS TO PLACE THEIR HORSES WHEN THEY GO TO THE STORE. THIS ISN'T SOMETHING THAT'S GOING AWAY. IT'S BEING PRESERVED AS TIME GOES ON AND PEOPLE RECOGNIZING IT AS PART OF THE CULTURE REALLY. SO UNDERSTANDING WHAT THAT MEANS AND MAYBE MAKING SOME OF THESE ADDITIONAL ALLOWANCES OR TRYING TO CHANGE THE WAY THAT SOME OF OUR CODES ARE WRITTEN TO ENCOURAGE THESE TYPES OF FACILITIES TO EXIST MORE OFTEN. MORE DESTINATIONS. SO ONE OF OUR BIGGEST CORE VALUES WHENEVER WE'RE DEVELOPING ANY TYPE OF AN ACTIVE TRANSPORTATION SYSTEM, THAT COULD BE FOR EQUESTRIANS, CYCLISTS, PEDESTRIANS, HIKERS, BACKPACKERS, IT DOESN'T MATTER. WE'RE LOOKING AT HOW DO WE CREATE THESE LOOP SYSTEMS. ONE OF THE THINGS THAT YOU WILL OFTEN HEAR COMPLAINTS ABOUT IF YOU BUILD A NEW TRAIL IS IF IT IS JUST AN OUT IN BACK TRAIL, THAT TENDS TO BE THE THING THAT I'M SURE ALL OF US PROBABLY AVOID WHEN WE'RE OUT RIDING A TRAIL SYSTEM. SO HOW DO WE MAKE SURE THAT -- SORRY -- DEVELOPING THESE TRAIL SYSTEMS, WE'RE LOOKING AT HOW CAN WE POTENTIALLY CREATE LOOPS WITHIN THEM. THIS HAPPENS TO BE A LARGE MASTER PLAN COMMUNITY THAT CONNECTS TO ONE OF THOSE TRAIL PARKS WE WERE LOOKING AT EARLIER. SO THEY WERE VERY FOCUSED ON HOW DO THEY UTILIZE EXISTING WASH AND WATER CORRIDORS AND NATURAL OPEN SPACES TO CREATE THESE LOOPS AND CONNECT INTO A NEW TRAIL SYSTEM THAT MIGHT BE ADJOINING IT. AND THIS IS ACTUALLY THAT TRAIL SYSTEM ADJOINING IT. SO LOOKING AT HOW THAT COMMUNITY OFF ON THE RIGHT-HAND SIDE VERRADO HAS COME TO CONNECT INTO THIS MASSIVE SKYLINE REGIONAL PARK TRAIL SYSTEM AND HOW THOSE TWO COME TOGETHER AND AGAIN HOW WE'RE CREATING LOOPS WITH DESTINATIONS AND POINTS. YOU'LL SEE SOME OF THESE ORANGE TRAILS ON THIS MAP WHERE THOSE ARE FOCUSED ON JUST GETTING TO SUMMITS. SO THERE ARE A LITTLE BIT OF OUT IN BACK TRAILS BUT WE TRY TO CREATE AS MUCH OF A LOOP SYSTEM AS POSSIBLE.

>> YEAH, AND THIS IS SHOWING A LITTLE BIT OF THE DIFFERENT OF SCALE OF DIFFERENT LOOPS. SO THE PRIOR SLIDE WAS A COMMUNITY OF LOOPS THAT RANGE FROM 1.7 MILE LOOPS AND A LITTLE BIT BIGGER WHERE THEN YOU GET INTO THIS REGIONAL PARK. YOU SEE THE LOOPS GET LARGER, BUT IT'S STILL

BASED ON PROVIDING THOSE CHOICES TO PEOPLE WHO HAVE DIFFERENT AMOUNTS OF TIME THAT THEY CAN SPEND RIDING, HIKING, AND THEY CAN PICK THEIR EXPERIENCE BASED ON THE LENGTHS OF THESE LOOPS AND ALSO JUST KIND OF BASED ON HOW MUCH TIME THEY HAVE TO GET TO IT.

>> EXACTLY. AND THEN WE'RE GOING TO LOOK AT EVEN LIKE LARGER-SCALE SYSTEMS. SO THIS IS THE TOWN OF GILBERT IN ARIZONA WHERE WE DEVELOPED A TRAIL SYSTEM WHERE IT REALLY DOES FOCUS MAINLY ON THESE HIGH-CAPACITY TRAFFIC AR TIER STREETS, BUT ATTEMPTING TO CREATE A MORE, LIKE A COMFORTABLE CORRIDOR FOR PEOPLE TO ACCESS. BUT YOU SEE WE PROVIDE A LOOP SYSTEM. SO WE HARDLY WILL EVER PLACE A TRAIL WITHIN THESE SYSTEMS THAT JUST KIND OF GOES OUT AND STOPS. ALL OF THESE TRAILS WANT TO CONNECT INTO ONE ANOTHER. SO THAT MEANS WE'RE CONNECTING INTO WASHES AND WE'RE CONNECTING INTO CANAL SPACES AND WE CREATED A CONNECTION ALONG A FREEWAY CORRIDOR ALONG WITH ALL OF THESE MAJOR ROADWAYS. SO LOOKING AT HOW THOSE ALL DEVELOP AND THEN HOW WE'RE CONNECTING SOME OF THESE MORE RURAL COMMUNITIES THAT TEND TO HAVE A HIGHER FOCUS AND CONCENTRATION ON EQUESTRIAN USAGE AND GETTING THEM INTO SOME OF THE DOWNTOWN AREAS. SO YOU CAN FOLLOW LITERALLY ALONG THIS ENTIRE TRAIL SYSTEM AND MAKE IT ALL THE WAY TO DOWNTOWN WHERE THEY STILL HAVE HITCHING POSTS READY AND AVAILABLE IN DOWNTOWN. SO IT'S LOOKING AT WHAT IS THE ACCESS THAT WE CAN PROVIDE AS PART OF THAT.

>> LET ME MAKE ONE OTHER COMMENT ABOUT THIS TOO. THIS IS A GREAT LEGEND AND THIS KIND OF EXEMPLIFIES SOMETHING WE'RE KIND OF OBSESSED ABOUT AND THAT IS IN ANY TRAIL SYSTEM THAT WE PLAN, WE MAKE A CLEAR DISTINCTION BETWEEN SURFACES THAT ARE PAVED AND UNPAVED BECAUSE IT'S THOSE TWO SURFACE CHOICES THAT REALLY RELATE DIRECTLY TO THE TYPES OF USERS AND WHAT THEY'RE LOOKING FOR THEIR EXPERIENCE. SO AND THEN ALSO FROM A CITY'S POINT OF VIEW, WHEN THEY GO TO IMPLEMENT THIS OR WHEN THE DEVELOPERS IMPLEMENT PORTIONS OF IT, IT'S VERY, VERY CLEAR WHAT KIND OF FACILITY THEY'RE BUILDING WHERE IN ORDER TO MAINTAIN THE LINKAGES AND THE LOOPS THAT WE'VE SHOWN HERE. AND THIS SYSTEM HAD ANYTHING FROM CONCRETE TO ASPHALT TO DECOMPOSED GRANITE. IT HAD A LOT OF DIFFERENT THINGS AND IT KIND OF MAKES A CRAZY MAP, BUT WE THINK IT'S REALLY IMPORTANT THAT THOSE TYPES OF FACILITIES ARE VERY, VERY CLEARLY DELINEATED ON A PLAN.

>> IT INCLUDES DIFFERENT TYPES OF PATHWAYS AND SIDEWALKS AND SO IT GOES BEYOND JUST THE TRAIL.

>> RIGHT.

>> AND THE DIFFICULTY. SO THIS IS -- THIS IS A WHOLE 'NOTHER BALL GAME. DIFFICULTY WILL RANGE IN HOW YOU LOOK AT IT DEPENDING ON WHERE YOU'RE AT. THIS HAPPENS TO BE A GUIDE FOR SOME OF THE INITIAL TRAILS BUILT WITHIN THE SKYLINE REGIONAL PARK. WE'RE LOOKING AT WHO THE TRAILS ARE REALLY MEANT TO BE USED BY AND THEN WHAT THE TRAIL RATING IS. SO THIS IS A REALLY DIFFICULT THING TO QUANTIFY FOR MOST PEOPLE. SO IT TENDS TO BE REALLY GETTING DOWN INTO LOOKING AT WHAT IS THE RANGE OF DIFFICULTY WITHIN YOUR DISTRICT OR YOUR AREA THAT YOU'RE FOCUSING ON AND POSSIBLY RATING IT OFF OF THAT OR LOOKING AT SOMETHING SIMILAR WITHIN YOUR REGION AS A COMPARISON. THERE'S A WHOLE DIVE INTO HOW WE CREATE THESE RATING SYSTEMS WITHIN ONE OF THE LINKS, BUT I BELIEVE CANDACE HAS ALREADY SENT OUT AS PART OF THIS WITHIN THE BUCKEYE SKYLINE TRAIL SYSTEM. SO IF YOU WANT TO DO A FURTHER READ INTO HOW YOU DEVELOP THOSE, THEY'RE THERE. BUT IT'S IMPORTANT TO LOOK AT WHO IS COMFORTABLE WITH USING THOSE TYPES OF FACILITIES.

>> AND IDEALLY, YOU'RE CREATING A RANGE OF DIFFICULTIES SO PEOPLE HAVE THE CHOICES OF WHEN THEY GET THERE OF HOW THEY WANT TO EXPERIENCE THAT PLACE.

>> SO LOOKING AT THE RANGE OF DIFFICULTY OF WHAT DOES IT MEAN TO BE RIDING IN A RURAL URBAN SETTING VERSUS A BACKCOUNTRY SETTING. IT'S TWO COMPLETELY DIFFERENT TYPES OF DIFFICULTY. AND IT REALLY DEPENDS ON YOUR HORSE AND YOUR RIDING HABITS, YOUR RIDING STYLE, WHAT LEVEL OF COMFORT THAT THESE WILL PROVIDE TO YOU AND HOW DIFFICULT THEY ACTUALLY ARE. SO IF YOU'RE RIGHT NEXT TO A ROADWAY, ARE YOU PREPARED, IS YOUR HORSE PREPARED TO RIDE WITHIN THAT ENVIRONMENT? AND THEN YOU HAVE KIND OF THE REVERSE OF IF WE'RE OUT ON A BACKCOUNTRY TRAIL, WE HAVE JUST AS MUCH OF A LIKELIHOOD OF RUNNING INTO A MOUNTAIN BIKER THAT'S BOMBING DOWN A HILL AT 35 MILES AN HOUR PLUS. SO RECOGNIZING THE FACT THAT DIFFICULTY COMES IN MANY KIND OF SHAPES AND FORMS. AND THEN REALLY THERE'S THE TRAIL DIFFICULTY, WHICH WE WERE TALKING ABOUT BEFORE, AND THE FACT OF GOING UP A SUMMIT TRAIL WITH SHARP TURNBUCKLES. I COULDN'T GET A PHOTO OF THE TRAIL BECAUSE WE'RE REALLY GOING BACK AND FORTH SO TIGHT AND IN QUITE A VERTICAL MOTION VERSUS THIS REALLY NICE LONG ELONGATED OPEN TRAIL GOING THROUGH A VALLEY. SO RECOGNIZING WHO IS COMFORTABLE WHERE IS REALLY IMPORTANT WHEN YOU'RE STARTING TO DEVELOP THESE TRAIL RATING SYSTEMS. AND THEN WE'RE DIVING INTO A LITTLE BIT OF

SAFETY AND COMFORT. SO REALLY WHAT WE WANT TO DO IS WE WANT TO PROVIDE AS SAFE AN ATMOSPHERE AS POSSIBLE WHEN WE'RE LOOKING AT CROSSINGS. WHEN WE'RE LOOKING AT HORSES CROSSING AT GRADE. SO ON THE SURFACE, ON A STREET, LOOKING AT HOW WE STRIPE FOR THAT, RECOGNIZING THE FACT THAT WE REALLY DO NOT RECOMMEND PUTTING STRIPING WHERE THE HORSES CROSS WHERE YOU WOULD FOR PEDESTRIAN. THEY SHOULD BE SEPARATED AWAY FROM WITH THE CROSSING IS AND ALLOW A NICE OPEN SPACE FOR THE HORSE TO CROSS TO, THAT WAY THEY DON'T THINK THERE'S A SNAKE ON THE GROUND OR WHATEVER IT MIGHT BE. THE CHANGE ON THE COLOR TEXTURES IS NOT GREAT, SO WE WANT TO AVOID THOSE. AND THEN WE GO TO UNDERPASSES AND TRYING TO OPEN UP THESE VIEWS. YOU CAN SEE THESE MASSIVE ROCK WALLS THAT WERE CREATED AS PART OF THIS UNDERPASS TO ALLOW FOR THIS REALLY WIDE RANGE OF SIGHT SO THEY DON'T FEEL LIKE YOU'RE WALKING INTO A TIGHT NARROW CORRIDOR AND THE WING WALLS ON THE UNDERPASS TO TRY TO OPEN IT UP AND THAT UNDERPASS IS OVER TEN FEET TALL AND TRYING TO MAKE IT REALLY, REALLY COMFORTABLE AND WIDE AND WHERE YOU CAN SEE THE OTHER END WITH LOTS OF LIGHTS STARTS TO MAKE THESE A MUCH MORE USABLE SPACE. AND THEN WE ALREADY TALKED ALL ABOUT THE OVERPASS THERE. AGAIN, STILL TALKING ABOUT CROSSING, THE FACT THAT WE RECOGNIZE THE NEED FOR CROSSINGS AND WHERE THEY NEED TO GO. I APOLOGIZE, THIS MAP GOT A LITTLE PIXELATED HERE. BUT WHETHER IT NEEDS TO BE AN ENHANCED CROSSING, SO SOMETHING THAT MIGHT BE A SIGNALIZED INTERSECTION OR SOMETHING THAT'S AS SIMPLE AS ROAD STRIPING AND JUST WARNING OF HORSE CROSSINGS AHEAD, TRYING TO FIND THE RIGHT BALANCE OF USING THESE SYSTEMS TO CREATE THESE LOOPS AND THEN HAVE SAFE AND COMFORTABLE CROSSINGS TO ALLOW PEOPLE TO UTILIZE THESE LOOPS WITHIN AN URBAN ATMOSPHERE IS THE ONLY WAY YOU'RE REALLY GOING TO HAVE A SUCCESSFUL TRAIL.

>> AND THE POINT OF THIS IS IN THE MASTER PLAN AGAIN FOR THIS COMMUNITY SO THAT THESE PLANS ARE DETERMINED DURING THAT PROCESS SO THAT THE COMMUNITY, THE TOWN HAS SOME DEFENSE WHEN THEY ARE UP AGAINST DEVELOPMENT OR OTHER KINDS OF PROJECTS THAT MIGHT THREATEN THE ABILITY TO PROVIDE CONTINUITY OF A TRAIL SYSTEM, THAT EVERYBODY KNOWS THIS IS THE EXPECTATION FOR THESE TYPES OF DIFFERENT CROSSINGS AND IT'S VERY CLEAR. IT CAN BE INCORPORATED INTO CAPITAL IMPROVEMENT BUDGETS THIS WAY. IT'S USED AS A LEVERAGING AGAINST FREEWAY PROJECTS SOMETIMES. IF IT'S ON A PLAN, THE TOWN ACTUALLY HAS A LITTLE BIT MORE DEFENSE IN REQUESTING ACCOMMODATIONS OF IT WHEN DEVELOPMENT HAPPENS.



>> YES, EXACTLY. AND THEN QUICKLY WE'LL GO THROUGH HOW PEOPLE ACCESS TRAILS BECAUSE I THINK WE'RE RUNNING A LITTLE BEHIND HERE, BUT WE'LL GET IT MOVING. SO ACCESS POINTS. SO ENSURING THAT WE HAVE AN EQUITABLE AMOUNT OF ACCESS POINTS INTO A TRAIL SYSTEM. SO WHAT THAT MEANS IS WE DON'T WANT WHEN WE'RE WORKING ON A RATHER LARGE PARK SPACE LIKE THIS TO ONLY HAVE TWO OR THREE ACCESS POINTS AND ONLY ONE STYLE. WE WANT TO MAKE SURE THAT WE HAVE THESE SMALL ENTRY NODES WHERE THERE MIGHT NOT EVEN BE A PARKING LOT. IT'S JUST A CROSSING GUARD TO GET IN OR STEP OVER A GATE OR WHATEVER IT MIGHT BE AT THAT POINT. IF IT'S A FULL-FLEDGED TRAILHEAD, I THINK THE LARGEST TRAILHEAD CURRENTLY DEVELOPED IN THIS PARK HOLDS OVER 350 CARS AND THEY HAVE PLANS FOR A NEW ONE THAT'S GOING TO HOLD OVER 500 I BELIEVE OR PLANS FOR EXPANSION OF IT. SO IT'S LOOKING AT HOW PEOPLE ACCESS THESE AND WHY THEY ACCESS THEM. AND MAKING SURE AS YOU START TO DIVE INTO IT, THAT AS YOU GO ALONG THE SYSTEM'S EDGE, YOU HAVE LOTS OF LITTLE CONNECTOR POINTS TO GET IN. AND AS YOU CAN SEE AS PART OF THIS TRAIL PLAN, THE CONNECTION POINTS DON'T JUST STOP AT THE BOUNDARY OF PARKS SO THEY CREATE EDGES, THEY GO ALL THE WAY INTO THE COMMUNITY. SO THIS GOES ALL THE WAY FROM REALLY WHAT WE CALL OUR FRONTCOUNTRY OF THIS PARK SYSTEM MOVING INTO MORE OF A RURAL EDGE AND THEN ALL THE WAY INTO REALLY A FAIRLY HIGHLY DEVELOPED URBAN ATMOSPHERE. SO HOW YOU CONNECT ALL THE WAY-OUT MILES AWAY FROM THE PARK TO CONNECT INTO IT IS REALLY IMPORTANT WITH CREATING SOMETHING THAT'S SUCCESSFUL. LOOKING AT NODES, BECAUSE WE'RE DOING A QUESTION TODAY, SIMPLE CROSSOVER GATES AND THE FACT THAT ALL A NODE HAS TO BE IS MAYBE A SPOT FOR SOMEBODY THAT LIVES IN THE NEIGHBORHOOD TO USE A STEPOVER GATE TO GET INTO A TRAIL SYSTEM. THE ONE ON THE RIGHT-HAND SIDE IS ACTUALLY SHOWING A PULLOFF WHERE YOU CAN PARK A TRAILER. IT REALLY ONLY HAS ROOM FOR A TRAILER TO PARK ON THE SIDE AND USE A STEPOVER GATE TO ACCESS THE SYSTEM. IT'S REALLY IMPORTANT FOR US TO SHOW THIS REALLY TEXTURED ASPHALT PARKING LOT, TO WHERE WE HAVE THESE LARGE OPEN PARKING SPACES AND LARGE AREAS WHERE HORSES CAN COME OUT, THE TEXTURE IS GOOD, IT'S NON-SLIP. MAKING SURE WE'RE PROVIDING WATER AND HITCHING RAILS AND SHADE AND MAYBE BLOCKS TO GET UP ON THE HORSES AND SIGNAGE AND WAYFINDING, MAKING SURE YOU HAVE THESE FACILITIES AS WELL BECAUSE NOT EVERYBODY IS GOING TO RIDE FROM THEIR HOUSE INTO THESE FACILITIES. THEY OFTEN ARE TRAIL RUNNING TO GET THERE. THE BYPASS THERE. SO WE LOVE TO REFER TO THIS AS THE QUOTE/UNQUOTE POOP TRAIL FOR HORSES AT MAJOR TRAILHEADS. EVERYBODY SHOULD LAUGH A LITTLE BIT AT THAT ONE. AS YOU PARK A TRAILER FOR YOUR HORSES, UNFORTUNATELY YOU CAN SEE IN THIS MASTER PLAN OR IN THIS AERIAL SHOT ON THE RIGHT, A BUNCH OF CARS DECIDED TO

PARK WITHIN THE HORSE TRAILER SPOT. THERE'S STILL ONE HORSE TRAIL CENTER THERE, CREATING THE BYPASS TRAIL IS FAIRLY IMPORTANT WITH ALLOWING TO REMOVE HORSES NOT ONLY FROM THE MAJOR TRAFFIC OF WHAT A SMALL CONGESTION POINT MIGHT BE LIKE THIS BRIDGE THAT CROSSES OVER INTO THE TRAIL SYSTEM FROM THE TRAILHEAD, BUT ALSO RECOGNIZING THE FACT THAT THE FIRST FEW MINUTES OUT OF THE TRAILER MIGHT BE A POINT AT WHICH THE HORSE OFTEN RELIEVES ITSELF. ONE OF THE MAJOR ISSUES WE HAVE WITH THESE LARGE TRAILHEADS AND INCLUDING EQUESTRIAN ACCESS AS PART OF IT, NOT THAT IT'S REALLY AN ISSUE, BUT THE DEFECATION THAT GOES ALONG WITH IT ON THE FIRST FEW MINUTES OF THE TRAIL. AND PEOPLE THAT ARE NOT EQUESTRIANS DON'T HAVE THE SAME UNDERSTANDING. SEPARATING TWO ACCESS POINTS CREATES A REALLY NICE, AS YOU CAN SEE IN THIS LOCATION THEY CROSS DOWN AND GO THROUGH THE SANDY WASH. THERE'S A PORTION OF THE TRAIL THAT GOES TO THE SANDY WASH AND CONNECTS TO THE TRAIL SYSTEM ON THE OTHER SIDE OF THE WASH. THIS IS A FAIRLY COMMON THING. THE SIGN IS FROM A COMPLETELY DIFFERENT LOCATION THAN THE AERIAL WE'RE SHOWING, BUT WE JUST WANTED TO GIVE THIS IDEA AND MAKE SURE EVERYBODY HAS AN IDEA OF WHAT IT IS. AND THEN THE TYPES OF TRAILS. SO WHEN YOU'RE LOOKING AT ACCESS TO TRAILS, THEY'RE OFTEN SELF-SELECTING. SO YOU SAW A FEW OF THESE SLIDES THAT MIGHT HAVE SAID LIKE "NO EQUESTRIANS ALLOWED," OR "NO HIKERS ALLOWED, NO BIKERS." A LOT OF THESE TRAILS ARE SELF-SELECTING. SO HORSES AND MOUNTAIN BIKERS MIGHT NOT LIKE THIS TRAIL ON THE LEFT AS MUCH, BUT THIS TRAIL IN THE CENTER MIGHT BE USABLE FOR EVERYBODY. BUT LIKE IN THIS SITUATION, A BYPASS TRAIL, THE HORSES MIGHT NOT USE IT BECAUSE THERE HAPPENS TO BE SOMETHING ELSE THEY LIKE MORE. IF WE'RE DOING THE TRAIL ON THE RIGHT, THAT'S REALLY HARD TO SEE, IT'S ACTUALLY ON THE BOTTOM. IT'S A SANDY WASH TRAIL WHERE YOU DON'T TEND TO HAVE A LOT OF BIKERS AND HIKERS DOWN THERE, MOSTLY EQUESTRIAN USERS GOING THROUGH SANDY WASHES. SO A LOT OF THESE TRAILS AS YOU START TO DEVELOP THEM, THEY START TO REALLY START TO SELF-REGULATE A LITTLE BIT, BUT IT MAY BE IMPORTANT FOR YOU STILL TO DESIGNATE SOME TRAILS TO BE SPECIFIC TO ONE USE OR ANOTHER, PARTICULARLY IN A CASE WHERE MAYBE WE HAVE ISSUES WITH A HORSE IS CAUSING DAMAGE TO A TRAIL OR A BIKER IS CAUSING DAMAGE TO A TRAIL OR A HIKER. WE HAD TO LOOK AT KIND OF THE BEST WAYS TO MANAGE THOSE TYPES OF FACILITIES THROUGH SELECTION VERSUS SELF-SELECTION. SO THAT WAS A LOT. SO THIS IS REALLY JUST THE BEGINNING OF WHAT WE THINK IT TAKES TO DEVELOP A SUCCESSFUL EQUESTRIAN TRAIL SYSTEM. WE COULD PROBABLY TALK ABOUT IT FOR THE NEXT THREE DAYS IF CANDACE WOULD LET US, BUT REALLY WHAT WE WANTED TO LEAVE YOU WITH IS A SERIES OF TAKEAWAYS FROM THIS PRESENTATION, ESPECIALLY FOR THOSE OF YOU THAT ARE TAKING THIS FOR

CONTINUING EDUCATION CREDITS TODAY. SO REALLY LOOKING AT THE USER AND WHO THE USERS IS, RECOGNIZING THERE'S REALLY A RANGE OF EQUESTRIAN USERS. ONE OF THE MOST IMPORTANT THINGS TO DO WHEN YOU'RE DEVELOPING A TRAIL SYSTEM, EVEN THOUGH WE'RE TALKING ABOUT HORSES AGAIN TODAY, IS FOR PEOPLE TO BAND TOGETHER AS THEY START TO DEVELOP THESE SYSTEMS. YOU HAVE A MUCH LOUDER VOICE IF THE EQUESTRIANS AND THE MOUNTAIN BIKERS AND THE HIKERS ALL JOIN TOGETHER TO REALLY PUSH A BETTER SYSTEM RATHER THAN SOMEBODY PUSHING FOR A SYSTEM THAT'S MEANT FOR JUST THEM. AND THEN RECOGNIZING A RANGE OF TRAIL TYPES THAT SOME USERS MIGHT WANT TO USE AND SOME MIGHT NOT. THE LOCATION, MAKING SURE THE TRAIL HIERARCHY FOLLOWS HOW YOU CAN DEVELOP THOSE LOCATIONS FOLLOWING THE TRAIL HIERARCHY AND RECOGNIZING WHAT IT MEANS TO BE IN AN URBAN ENVIRONMENT AND A REMOTE FRONTCOUNTRY AND BACKCOUNTRY ENVIRONMENT. THE EXPERIENCE, WE LOOK AT THE DESTINATIONS FOR WHERE ARE WE GOING AND HOW ARE WE GETTING THERE, WHERE DO YOU WANT TO RIDE. DO YOU WANT TO RIDE IN YOUR NEIGHBORHOOD, MAYBE AN URBAN SETTING OR ARE YOU TRAILERING OUT TO RIDE OFF INTO THE SUNSET. THE RANGE OF DIFFICULTY THOSE PROVIDE AND THEN WHAT'S THE SAFETY AND COMFORT LEVEL THAT WE HAVE WITHIN THOSE FACILITIES. AND THEN ACCESS. THE TWO MOST IMPORTANT THINGS TO US IS HOW DO YOU GET TO THE TRAIL AND HOW DO YOU USE THE TRAIL. THOSE ONES ARE PRETTY SIMPLE. SO WITH THAT, I WANT TO THANK YOU AND WE WANT TO PASS IT OVER TO MATT PROBABLY 15 MINUTES LATER THAN I PLANNED ON BUT I THINK WE'VE GOT TIME FOR IT.

>> OKAY. HI, EVERYBODY. I AM MATT WOODSON FROM OKANOGAN TRAIL CONSTRUCTION. I HAVE BEEN BUILDING TRAILS SINCE 1983 AND DONE A LOT OF WORK ON WILDERNESS TYPE OF TRAILS THAT ARE HEAVILY USED BY EQUESTRIANS. SO I HAVE DEVELOPED A LOT OF MY CONSTRUCTION, RECONSTRUCTION MAINTENANCE TECHNIQUES FROM ACTUALLY JUST DEALING WITH A LOT OF BACKCOUNTRY TRAILS THAT GET A LOT OF DAMAGE FROM VARIOUS USER GROUPS, BUT PARTICULARLY WE GET A LOT OF PACK CAMPS AND STUFF LIKE THAT THAT CONCENTRATE A LOT OF STOCK INTO ONE AREA. AND SO, I'M JUST GOING TO GO OVER AND GIVE YOU GUYS SOME IDEAS ON WHAT I SEE AS THE BEST PRACTICES FOR TRAIL DESIGN AND TRAIL CONSTRUCTION. A LOT OF THE CONSIDERATIONS THAT WE USE IN DESIGN OF BACKCOUNTRY TRAIL ARE LISTED HERE. THIS IS JUST A SMALL GROUP OF THEM, BUT IN GENERAL IT'S VERY IMPORTANT, A HORSE'S WEIGHT IS MUCH GREATER THAN THE OTHER USER GROUP, SO NOT NECESSARILY THEIR IMPACT ON THE TRAIL, THE ACTUAL WEIGHT DISTRIBUTION OF A HORSE, THE HORSE'S HOOF ON A TRAIL IS ABOUT WHEN WALKING AROUND 100 POUNDS PER SQUARE

INCH, WHERE AN INDIVIDUAL WALKING MIGHT BE 15. THAT ALL VARIES BASED ON THE SIZE OF A HORSE'S HOOF OR THE SIZE OF A PERSON'S FOOT OR IF YOU LOOK AT A MOUNTAIN BIKE, THE AMOUNT OF TIRE THAT IS TOUCHING THE GROUND. MOUNTAIN BIKE ACTUALLY HAS MORE PSI, AS THEY CALL IT, PER VEHICLE OR PER INDIVIDUAL THAN A PERSON OR A HORSE JUST STANDING, BUT IF A HORSE IS MOVING, IT WILL DISTRIBUTE ITS WEIGHT AND DEPENDING ON IF IT'S CLIMBING A TRAIL OR DROPPING DOWN A HILL, IT COULD BE AS MUCH AS 400 PSI. SO THAT'S HOW MANY POUNDS PER SQUARE INCH ARE IMPACTING THE TRAIL. SO OBVIOUSLY, THE ELEMENTS FOR THE DIFFERENT USERS ARE NECESSARILY DIFFERENT BECAUSE THEY IMPACT THE TRAIL SURFACE DIFFERENTLY. ONE OF THE THINGS THAT, WITH TREAD IN PARTICULAR WITH HORSES, IS THAT WE NEED A PRETTY SOLID TREAD. A LOT OF TIMES I SEE EQUESTRIAN TRAILS THAT GO OFF, SAY, THROUGH THE MIDDLE OF A MEADOW, NOT REAL GOOD SPOT FOR A HORSE TRAIL, EVEN THOUGH EVERYONE WOULD LIKE TO BE IN THE MIDDLE OF THE MEADOW VIEWING IT. IT'S THE SOFTEST GEOLOGY OF THE FOREST. AND THOUGH I WORK HERE IN ARIZONA CURRENTLY WHERE WE DEAL WITH A LOT OF ROCK AND HAVE A MUCH MORE COMPACTIBLE SOIL, I ALSO WORK ALL OVER THE U.S. AND IN OTHER COUNTRIES DEVELOPING AND DESIGNING THESE TRAILS. AND SOME OF THE SAME TECHNIQUES WORK NO MATTER WHERE YOU ARE. AND IT DOESN'T MATTER HOW MUCH RAIN YOU GET, HOW DRY IT IS, HOW SOFT YOUR SOIL IS, THESE ARE ALL TECHNIQUES THAT I USE THAT WORK IN DIFFERENT ENVIRONMENTS. SO GEOLOGY OBVIOUSLY IS ONE OF THEM. AND GEOLOGY VARIOUS EVERYWHERE IN THE FOREST, IN THE WILDLANDS. I'M ONLY GOING TO DEAL WITH WILDLAND TRAILS TODAY BECAUSE THAT'S WHAT WE DIDN'T REALLY ADDRESS IN OUR LAST WEBINAR. AND SORRY ABOUT THAT POPPING SOUND IF YOU GUYS GET THAT. I CAN'T FIGURE OUT HOW TO SHUT THAT OFF ON MY COMPUTER, BUT IT KEEPS HAPPENING. I'M SURE PEOPLE ARE SENDING ME MORE TEXTS TODAY THAN USUAL. SO GEOLOGY AND TRAIL LOCATION ARE TO ME THE MOST IMPORTANT PARTS OF DESIGNING EQUESTRIAN TRAILS. EQUESTRIAN TRAILS COULD BE -- THEY CAN BE BUILT ANYWHERE, I MEAN, OTHER THAN FACES AND SUCH, TRAILS IN GENERAL CAN BE BUILT ANYWHERE. IT'S JUST WHAT'S THE COST THAT YOU WANT TO PAY TO BUILD A TRAIL. SO WE HAVE TO LOOK FIRST AT THE LOCATION THAT IS THE -- SOUGHT OUT AS A POSSIBLE NEW TRAIL, AND THAT TAKES A LOT OF RESEARCH. PEOPLE DON'T REALIZE IN DESIGN THAT IT'S NOT REALLY A MATTER OF JUST GOING FROM POINT A TO B. IT'S HOW YOU GET THERE. AND THAT CAN VARY BY GREATLY FROM 10 FEET UP A SLOPE TO 10 FEET DOWN A SLOPE EVERYWHERE THAT YOU TRAVEL THROUGH HAS VARYING GEOLOGY. YOU CAN HAVE SOFT SPOTS. YOU CAN HAVE YOUR MUD AREAS. YOU HAVE YOUR SPRINGS, ALL OF THESE DIFFERENT THINGS THAT YOU NEED TO TAKE INTO ACCOUNT. SO IF YOU'RE ACTUALLY LOOKING TO DESIGN A NEW TRAIL THROUGH WILD COUNTRY, THROUGH WILDLANDS, YOU WILL WANT TO

FIRST LOOK AT YOUR DESTINATIONS AND WHERE YOU WANT TO GO, BUT ALSO YOU WANT TO LOOK AT WHAT'S THE DIFFERENCE IN THIS VALLEY FROM THIS VALLEY OR THIS SIDE OF THIS SLOPE FROM THAT SIDE OF THE SLOPE. ALL OF THESE ARE DIFFERENT ASPECTS. SO IF WE LOOK CAREFULLY AND OFTENTIMES LIKE I'LL ENCOUNTER WHEN DESIGNING, EVERYTHING WILL BE PERFECT AND I'LL GET TO AN AREA THAT'S REALLY NOT SUITABLE. THERE'S NOTHING WORSE -- EXCUSE ME -- THAN DESIGNING A TRAIL THAT IS DESIGNED TO FAIL. AND YOU CAN OFTEN GET A MAJORITY OF A TRAIL RIGHT AND THEN PARTS OF IT ARE JUST GOING TO BE PROBLEMATIC. AND SO THAT'S WHAT I WANT TO KIND OF TALK ABOUT TODAY IS JUST HOW TO DEAL WITH THOSE THINGS, HOW TO GET A TRAIL IN THE RIGHT LOCATION. AS WE MOVE THROUGH THE SLIDE SHOW, I'LL BE DEALING WITH SOME OTHER ASPECTS, DRAINAGE, SIGHT LINES, YOU PROBABLY ALREADY READ THIS. THESE ARE ALL VERY IMPORTANT ASPECTS. BUT THE FIRST THING IS GEOLOGY AND LOCATION. SO I'M GOING TO MOVE ON TO THE NEXT SLIDES AND WE'LL LOOK AT SOME OF THOSE ASPECTS MORE CLOSELY. IF I CAN GET MY SLIDE TO MOVE HERE. THERE WE GO. SO SOME OF THE FUNDAMENTALS OF THE TREAD. WE'LL START WITH THE TREAD. FIRM AND STABLE, OBVIOUSLY AN IMPORTANT ASPECT TO AN ANIMAL THAT HAS A 100 TO 400 PSI IMPACT ON THE EARTH. SMOOTH AND FREE OF OBSTACLES, VERY IMPORTANT BECAUSE WHAT HAPPENS ON TRAILS IS THAT IF YOU -- A LOT OF TIMES, PEOPLE FEEL THAT OTC OVERBUILDS TRAILS. IN THE BEGINNING OF A TRAIL, IT'S SUPER IMPORTANT TO START WITH A COMPLETELY SMOOTH TRAVELWAY. AND THE REASON FOR THAT IS THAT, FOR ONE, AND IN PARTICULAR EQUESTRIANS BUT ALL USERS, EVEN IF THERE'S A SMALL ROCK STICKING UP, THEY'RE GOING TO START WALKING AROUND THAT ROCK AND PRETTY SOON THEY'RE GOING TO CREATE A LINE AND THAT LINE IS GOING TO, YOU KNOW, REDUCE THE USAGE OF THE TREAD. THE TREAD, YOU KNOW, IN MY OPINION, THE BEST TREAD WIDTH FOR WILDLAND EQUESTRIAN TRAILS IS FOUR FEET STARTING. AND THE REASON FOR THAT IS BECAUSE MY EXPERIENCE HAS BEEN THAT IF WE CREATE WIDER TRAILS, PARTICULARLY FOR EQUESTRIAN USE, THAT EVEN THOUGH HORSES TEND TO FOLLOW EACH OTHER, THEY WILL VARY THEIR USAGE ACROSS THE TRAIL. THE BEST TRAILS I'VE BUILT FOR SUSTAINABILITY FOR EQUESTRIANS HAS BEEN EIGHT-FOOT-WIDE BECAUSE -- BUT THAT'S ONLY APPROPRIATE IN SOME SITUATIONS. THAT'S NOT A NICE TRAIL FOR THE WILDERNESS. BUT WHAT I'VE OBSERVED IS THAT IT'S WIDE ENOUGH THAT THE HORSES SPREAD OUT THEIR USE AND THEREFORE NEVER CREATE TROMPING OR TRENCHING, WHICH IS ONE OF THE MAIN PROBLEMS WITH NARROW HORSE TRAILS. SO WHAT WE WANT TO DO IS CREATE A NICE WIDE SURFACE THAT IS FREE OF OBSTACLES SO THAT THE USERS, WHOEVER THEY MAY BE, WON'T BE INCLINED TO ALL GO A CERTAIN WAY BECAUSE OF OBSTRUCTIONS THAT ARE EMERGING FROM THE TRAIL. AND THAT COULD BE ROCKS. IT'S ANOTHER GOOD REASON THAT MAINTENANCE CAN SAVE TRAILS

FROM BECOMING TRENCHED BECAUSE AS LONG AS YOU KEEP THE ENTIRE ORIGINAL TREAD SURFACE FREE OF OBSTACLES, ALL USERS WILL USE THE WHOLE TRAIL. AND IT'S ONLY WHEN THEY STOP HAVING THAT ABILITY BY OBSTRUCTIONS THAT THEY START MOVING DOWN TO NARROWER AND NARROWER LINES WHICH CREATES MUCH HEAVIER WEAR IN THOSE AREAS OF THE TREAD SURFACE. AND IT'S SUPER IMPORTANT TO HAVE A SMOOTH TRAIL AND NOT JUST FOR THE SAFE OF A LOT OF PEOPLE, ESPECIALLY MOUNTAIN BIKERS, THEY LIKE THE CHALLENGE OF ROCKS TO JUMP AND DIFFERENT THINGS TO MAKE IT MORE TECHNICAL. THAT HAS ITS PLACE IN TRAILS BUT FOR MULTIUSE TRAILS WHICH WE BUILD A LOT OF, I HAVE TO KIND OF IRON OUT THE BEST PART OF THINGS PER INDIVIDUALS. SO IN GENERAL, I'M NOT EVEN GOING TO TALK TODAY ABOUT EQUESTRIAN-ONLY TRAILS BECAUSE EVERYTHING THESE DAYS IS MULTIPLE USE AND THE SHARED USE IS THE MOST BENEFIT FOR THE GREATEST NUMBER OF PEOPLE. AND AS TRAILS ARE BOOMING, WE HAVE TO JUST FIND THE LINE IN THE MIDDLE THAT IS THE BEST FOR EVERYBODY. THERE CAN BE A BIKE PUMP TRACK OVER HERE THAT'S JUST FOR BIKES, BUT IN GENERAL EVERYONE WANTS ACCESS TO ALL THE TRAILS. THAT'S A NATURAL THING THAT PEOPLE WANT BECAUSE THEY'RE MISSING SOME OF THE EXPERIENCES IF THEY DON'T, IF THEY CAN'T USE THEM ALL. SO NO ONE'S REALLY TRYING TO HOLD PEOPLE DOWN TO ONE KIND OF USE THAT MUCH ANYMORE BECAUSE THERE'S SO MUCH RESISTANCE. THE DELINEATION FROM SURROUNDING TERRAIN IS ANOTHER IMPORTANT POINT BECAUSE LIKE WHEN YOU MOVE THROUGH A, SAY A MEADOW, THE TRAIL GETS LOST AND YOU GET A LOT OF DIFFERENT BRAIDING AND DIFFERENT -- OF THE DEGRADATIONS THAT HAPPEN FROM IT NOT BEING A CLEAR LOCATION. SO THE LOCATING OF THE TRAIL SHOULD BE IN AN AREA THAT MAKES THE TRAIL VISIBLE FROM THE REST OF THE TERRAIN. ONE OF THE REASONS WE LIKE HAVING IT ON A GOOD SIDE SLOPE WHERE IT'S SET IN AND HAS MANY GOOD OPTIONS BY BEING ON A SIDE SLOPE. I LIKE TO USE A CROSS SLOPE OF 2 TO 3% GRADE. ANY MORE THAN THAT AND YOU START GETTING KIND OF WHAT WE CALL TRAIL CREEK. I'LL TALK ABOUT THAT. LONGITUDINAL SLOPE, MAXIMUM 10 TO 15. TYPICAL 4 TO 5 FOOT WIDTH AND PROPER TURNING RADIUS. SO LET ME TAKE A SIP HERE.

>> HEY, MATT. CAN YOU HEAR ME?

>> YES, I CAN.

>> OKAY. I JUST WANTED TO LET YOU KNOW THAT WE ARE OVER ON THE TIME AS FAR AS HAVING 20 MINUTES FOR Q&A BUT WE CAN STAY PROBABLY ANOTHER 15 MINUTES AFTER YOUR PRESENTATION.

>> OH.

>> FOR AT LEAST, YOU KNOW, 11:45 AM PACIFIC TIME. SO JUST TO LET YOU KNOW BECAUSE I KNOW YOU HAVE QUITE A FEW SLIDES LEFT, WE MAY SAVE A LITTLE LATER FOR Q&A. OKAY?

>> OKAY. AND THE OTHER THING I'LL SAY ABOUT THAT IS, WHETHER OR NOT YOU DON'T GET THE QUESTION TIME, IT'S HARD TO ANSWER A QUESTION, YOU KNOW, JUST BRIEFLY ON A CALL. LIKE I ENCOURAGE ANYBODY, QUESTIONS ARE USUALLY MUCH MORE COMPLEX THAN JUST A SIMPLE ANSWER CAN DO. SO IF ANYBODY WANTS TO JUST EMAIL ME AFTER AND LESSEN THAT QUESTIONING TIME, I WOULD MUCH PREFER TO ANSWER ANY PARTICULAR QUESTIONS BY EMAIL THAN IN PERSON. SO, YOU KNOW, JUST KEEP THAT IN MIND.

>> SOUNDS GOOD, MATT.

>> ALL RIGHT. SO, LET'S GET INTO DRAINAGE FIRST HERE. I TALKED A LITTLE ABOUT TREAD. DRAINAGE -- THE AREA IN THIS PICTURE THAT HAS BEEN WORKED IS THE SIZE OF THE DRAINAGE. DRAINAGES ARE NOT GOOD WHEN THEY'RE SHORT AND SWEET. THEY'RE GOOD WHEN THEY'RE LARGE, WIDE, AND SHALLOW LIKE THIS. AND ONE OF THE THINGS ABOUT DRAINAGE THAT PEOPLE DON'T REALIZE IS WHEN A TRAIL IS PROPERLY DESIGNED, DRAINAGE IS BUILT INTO EVERY FOOT OF THE TRAIL. AND THE DRAINAGE ISN'T BUILT TO RELY ON DRAINAGE DIPS. DRAINAGE DIPS ARE KIND OF LIKE A RELIEF VALVE OR A SECONDARY RELIEF FOR IF THE FIRST, THE PRIMARY METHOD OF WATER DRAINING, WHICH IS JUST SIMPLE GOOD OUTSLOPING AND A GOOD CROSS-SLOPE ON THE TRAIL THAT WILL DRAIN THE WATER DIRECTLY FROM WHERE IT COMES OFF THE HILLSIDE ABOVE AND HITS THE TRAIL AND CROSSES AND GOES BELOW. THAT'S WHAT WE'RE LOOKING FOR. SO DRAINAGE IS SUPER IMPORTANT AND IT HAS TO BE BUILT INTO THE TRAILS ORIGINALLY. AND IT'S NOT THE ANSWER-ALL TO GOOD DRAINAGE. IT'S THE ANSWER-ALL TO GOOD TRAIL SUSTAINABILITY. WHAT YOU REALLY WANT IS LARGE DIPS PLACED ACCORDING TO THE TERRAIN THAT WHEN WATER DOES GET TRAPPED WITHIN THAT AREA BECAUSE EVENTUALLY BERM WILL BUILD UP ON TRAILS AND VARIOUS ASPECTS THAT WATER WILL RUN DOWN THE TRAIL. THAT'S WHAT THE DIPS ARE THERE FOR. BUT THE TRAIL ITSELF HAS A SEPARATE DRAINAGE SYSTEM, PRIMARY DRAINAGE SYSTEM WHICH IS JUST ALLOWING WATER TO CROSS DIRECTLY AND THE DESIGN BEING SUCH THAT IT CAN ALLOW THAT. ONE THING A LOT OF PEOPLE DON'T REALIZE, WE THINK ABOUT A LOT HERE IN THE DESERT, IS THAT I'VE SEEN PLACES WHERE THE TRAIL IS TRENCHED FOR A QUARTER MILE, SO EVERYTHING COMING FROM THE BACKSLOPE ONTO THE TRAIL THEN TRAVELS A QUARTER MILE DOWN THE TRAIL AND GOES OFF ON

ONE TREE OR IF THEY'RE LUCKY ENOUGH TO BE A TREE THERE. WHERE THE FACT IS, IS THAT TRAILS ARE CUTTING OFF THE DRAINAGE TO EVERYTHING BELOW IN A NATURAL SYSTEM, WATER WOULD FLOW DOWN A HILL AND WATER ALL THE VEGETATION. BUT THE TRAILS CAN END UP BEING, YOU KNOW, A STUMBLING BLOCK FOR THAT IN THAT THEY STOP THE WATER AND THEN AVERT IT DOWN THE TRAIL. SO IT'S SUPER IMPORTANT TO GET GOOD CROSS-SLOPING ON NEW TRAILS, HARDER TO DO ON EXISTING TRAILS. AND I DON'T HAVE A LOT OF TIME OBVIOUSLY LEFT HERE, SO I CAN'T GO INTO LOT OF THE STUFF I WOULD, BUT WE CAN TOUCH ON IT FURTHER AT SOME POINT AT THE QUESTIONS. SO THIS, AGAIN, THIS IS JUST TALKING ABOUT HOW I SAID, THIS IS WHAT WE WANT TO SEE. THIS IS HOW WATER SHOULD TRAVEL ACROSS A TRAIL AND NOT RELY ON DIPS. IT SHOULD JUST CROSS DIRECTLY LIKETHIS. AND YOU CAN SEE THIS IS A PLACE WHERE HEAVY WATER HAS DONE THAT AND IT'S LEFT THE TRAIL RELATIVELY UNDEAMAGED. IT'S CROSSING HOW IT SHOULD, BUT IT'S JUST A HIGH FLOW. AND IN ARIZONA, WE GET THREE INCHES OF RAIN IN AN HOUR SOMETIMES. IT CAN BE REALLY DEVASTATING ON THE GROUND, WHERE I KNOW OTHER PLACES IN FORESTED PLACES, WE'RE OFTEN DEALING WITH JUST A MORE STEADY STREAM, MUCH MORE ABSORPTION ON THE SOIL TIME, SO THE WATER WILL NOT JUST RUN THE SURFACE LIKE IT DOES IN THE DESERT. SO IT'S STILL THE SAME CONCEPTS WORK FOR EITHER TYPE OF TRAIL. THESE ARE SOME OF THE OTHER KINDS OF DIPS. A KNICK IS JUST A SPOT WHERE IT COMES OUT TO HAVE A NATURAL DRAIN. THESE ARE GOOD ADDITIONS TO ADD IN, BUT A LOT OF THESE ARE BETTER THINGS THAT YOU WOULD ADD IN ON AN EXISTING TRAIL TO TRY TO GET DRAINAGE. ON A FLAT TRILL I DON'T WANT MORE THAN 100 FEET WITHOUT DRAINAGE AND ON A HILLSIDE TRAIL, I WOULD LIKE TO SEE IT EVERY 50 FEET AND IF IT GETS OVER 10 TO 15%, I WOULD LIKE TO SEE MAXIMUM OF EVERY 30 FEET. LET'S SEE HERE. SO THESE ARE DIFFERENT KINDS OF TREAD SLOPE POSSIBILITIES AND MAINLY I STICK TO THE OUTSLOPE STYLE THAT IS AT THE BOTTOM. ON FLAT GROUND A LOT OF TIMES PEOPLE TRY THAT, BUT IT'S REALLY NOT THAT USEFUL. WE NEED TO BE DOWN TO NATIVE COMPACTION ON THESE TRAILS. THIS CAN'T BE FILL. ALL THESE TRAIL TREAD TYPES HAVE TO BE SCRAPED CLEAN DOWN TO WHAT IS ALREADY COMPACTED. A LOT OF PEOPLE ARE MAKING TRAILS THESE DAYS AND THEY'RE JUST KIND OF COVERING IT OVER WITH THIS NICE LAYER OF SMOOTH DIRT THAT MAKES IT LOOK REALLY GOOD FOR LESS THAN A YEAR AND THEN AFTER THAT WHAT WAS UNDER THE DIRT STARTS TO SHOW BECAUSE ALL THE DIRT WASHES AWAY. IT NEEDS TO BE, YOU KNOW, SCRAPED CLEAN, NOT BUILT UP. THAT'S A NO-NO IN MY COMPANY AND WE'VE HAD EXCELLENT RESULTS FROM NEVER USING FILL OTHER THAN MAYBE IF YOU PULL A ROCK OUT OR SOMETHING AND YOU NEED TO FILL A HOLE.

>> HEY, MATT, IF I CAN INTERRUPT YOU ONE MORE TIME. I'M SO SORRY.



>> YES, YES.

>> I'M GOING TO LET YOU GO AHEAD AND FINISH YOUR PRESENTATION WHERE WE MIGHT NOT HAVE TIME FOR THE LIVE Q&A. WE HAVE A LOT OF GREAT QUESTIONS THAT PROBABLY REQUIRE MORE IN-DEPTH ANSWERS. FOR EVERYONE THAT IS LISTENING, WE WILL GET TO ALL OF YOUR QUESTIONS IN WRITING FOR SURE BECAUSE I WILL BE WORKING WITH ALL OF THE PRESENTERS. YOU ARE WELCOME TO EMAIL THEM AS WELL, BUT I AM GOING TO SEND ANY QUESTIONS THAT COME IN. I'M GOING TO WORK WITH THEM. I'LL EMAIL THE DOCUMENT ONCE IT'S COMPLETED TO EVERYONE BUT I'LL ALSO ADD IT ONLINE. SO THAT WAY, MATT, IF YOU WANT TO FINISH WITH YOUR PRESENTATION, IF WE GO OVER TIME, IF PEOPLE HAVE TO LEAVE, THAT'S FINE. WE ARE RECORDING THE PRESENTATION. SO, MATT, YOU KEEP ON GOING.

>> OH, THANK YOU. ALL RIGHT. SO HERE WE HAVE A NICE, YOU KNOW, SIDE-SLOPE TRAIL. THE DRAINAGE COMES OFF THE BACK SLOPE, GOES STRAIGHT CROSS. THIS IS A GOOD, LOOKS LIKE A FAIRLY NEW TRAIL. THAT'S A GOOD SITUATION. THAT'S WHAT WE'RE LOOKING FOR WITH THE DRAINAGE. AND WIDTH-WISE, THIS IS A LITTLE NARROWER THAN WHAT I WAS SAYING ABOUT FOUR FEET. FOUR FEET, IF YOU HAVE A GOOD AMOUNT OF SHOULDER, WHICH THEY HAVE NO SHOULDER HERE, HORSES CAN PASS EACH OTHER CONVENIENTLY OR OTHER USERS. THE NARROWER YOU GET, EVERYONE LIKES THE FEEL OF THE SINGLE TRACK LITTLE NARROW TRAIL, IT MIGHT BE 18 INCHES WIDE AND THAT GIVES THE MOST GOOD FEELING TO A TRAIL, BUT THAT HAS A MUCH HIGHER IMPACT ON THE AREA OF TREAD BY THE USERS AND THEY JUST DON'T LAST AS LONG. SO I ENCOURAGE TO START WITH WIDER TRAILS. THIS IS WHAT WE CALL A FALL-LINE. YOU CAN'T QUITE TELL, BUT IF YOU LOOK AT THE HORSES, THEY'RE COMING DOWNHILL FAIRLY STEEP. THAT'S A SURE WAY TO COLLECT WATER ONTO A TRAIL, WHICH WILL DAMAGE IT. IT'S NOT A COMFORTABLE RIDE. EVERYTHING ABOUT IT IS WRONG FOR TRAILS. FALL-LINES ARE NOT A TRAIL TECHNIQUE AND THEY SHOULD BE BANISHED FROM TRAILS. FALL-LINES ARE THE NUMBER-ONE CAUSE OF DEGRADATION TO A TRAIL THAT I'VE RAN INTO, IS PEOPLE DON'T UNDERSTAND THAT YOU HAVE TO WORK WITH THE SLOPE, WORK WITH WATER, THE WAY THE WATER NATURALLY FLOWS ON HILLSIDES, ON FLATLANDS, ON EVERYTHING. YOU HAVE TO BE VERY OBSERVANT OF WHAT'S ALREADY HAPPENING ON WHATEVER YOUR AREA IS, WHATEVER YOUR LANDSCAPE TYPE IS. YOU CAN OBSERVE WHAT'S ALREADY HAPPENING AND GET A LOT OF ANSWERS ON HOW TO MAKE A TRAIL WORK. ONE OF THOSE THINGS IS SIMPLY NOT DOING A FALL-LINE ANYWHERE. IT DOESN'T MATTER WHERE. DON'T BUILD IN THE FALL-LINES. DON'T ACCEPT FALL-LINE DESIGN. IF SOMEBODY IS DESIGNING FOR YOU AND

YOU RECOGNIZE THE FALL-LINE, MAKE THEM REDO IT BECAUSE THIS IS NOT AN ACCEPTABLE TRAIL DESIGN. SO THIS ONE, IT'S HARD TO KIND OF SEE THE TRAIL, BUT IT'S COMING DOWN THE HILL AND THEN IT TURNS RIGHT THERE. SO REALLY WHAT'S HAPPENED IS PEOPLE HAVE BEEN THROWING ROCKS IN THIS TO TRY TO GET PEOPLE TO GO WHERE THEY WANT TO GO AND THEY'RE CUTTING THIS CORNER. BUT ROCK, A LOT OF TIMES PEOPLE UTILIZE ROCKS FOR THINGS, THEY'RE KIND OF A TEMPORARY FIX. LIKE MAYBE FOR THE BERM ON THE BOTTOM OF THIS TRAIL, THE STACKED ROCK IS SUITABLE. BUT ONE THING THAT ROCKS DO THAT PEOPLE DON'T REALIZE IS THAT WHEN WATER FLOWS, AND YOU'VE SEEN THIS IN STREAMS, IS IF IT HITS SOMETHING HARDER LIKE A DISSIMILAR MATERIAL, THEN DIRT IS ROCK, IT WILL EDDY AROUND THE WALK AND BASICALLY STARTS DIGGING A HOLE. I SEE PEOPLE THROW A ROCK IN A DIP. THEY THINK IT'S GOING TO ACT AS VELOCITY DIFFUSER, WHICH IT CAN DO IF PLACED PROPERLY, BY AT THE SAME TIME, EVEN THOUGH DIRT IS MADE OUT OF ROCK, THEY'RE DISSIMILAR MATERIALS. ONE IS HARD AND UNMOVABLE. THE OTHER IS VERY MALLEABLE. SO STONES SHOULD BE USED VERY THOUGHTFULLY IN HOW THEY ARE PUT IN TRAILS, NOT JUST STUCK ANYWHERE. OFTENTIMES THEY END UP BECOMING IMPEDIMENTS RATHER THAN BENEFICIAL. SO IN THIS CASE, BASICALLY PEOPLE WERE CUTTING THIS CURVE. PEOPLE ARE TRYING TO STOP IT BY PUTTING ROCKS. THEY'RE ACTING AS SOME KIND OF MITIGATION, BUT REALLY THEY CAN CAUSE, END UP CAUSING MORE EROSION JUST BY USING THEM IN THIS TYPE OF SITUATION. HERE'S THAT NARROW LITTLE TRAIL EVERYBODY LOVES, TIGHT LITTLE SIDE SLOPE TRAIL LEADING UP TO A SADDLE OF SOME KIND. AND THIS TRAIL OBVIOUSLY HAS LASTED, THOUGH THERE'S NOT A LOT THERE TO HOLD. BUT JUST RUNNING A SIDE SLOPE, EVEN IF THE SLOPE IS NOT SO GREAT, IT'S ONE OF THE MAIN DESIGN FEATURES I LIKE TO USE IS TO USE THE HINGE POINT OF A CHANGE IN TRAIL. SO IF YOU CAN, AND I FIND THAT I CAN A LOT OF THE TIME, IS PLACE THE TRAIL RIGHT WHERE YOU GO FROM A LESSER STEEP SIDE SLOPE TO A GREATER STEEP SIDE SLOPE. THAT'S KNOWN AS A HINGE POINT BECAUSE THE PREVAILING GRADE CHANGES FROM ONE THING TO ANOTHER AND YOU'LL SEE IT ALL THE TIME AT THE BASE OF HILLS. THE HILL COMES DOWN, THEN IT FLATTENS OUT SOME. SO YOU ALWAYS WANT TO BE UP ON THE HILLSIDE BUT YOU WANT TO USE THE DRAINAGE BELOW YOU TO BE GREATER. SO PLACING TRAILS ON THE HIGHEST GROUND AND FLAT AREAS AND THEN ON HINGE POINTS OF PREVAILING SIDED SLOPE GRADE ARE SUPER IMPORTANT DESIGN FACTORS FOR PLACING A TRAIL CORRECT THE FIRST TIME. WE BUILD HUNDREDS OF MILES OF THESE TRAILS. WE WORK YEAR-ROUND DOING THIS. AND WE HAVE TRAILS THAT ARE TEN YEARS OLD THAT STILL DON'T NEED MAINTENANCE. IT'S BECAUSE I FOLLOW THESE TECHNIQUES AND THEY SEEM TO STILL -- NO MATTER WHERE I'VE DONE IT, I'VE BEEN DESIGNING IN CONGO AND PUERTO RICO ON THE EAST COAST. IT ALWAYS SEEMS TO -- THE SAME

PRINCIPLES WORK. NOW I'M GOING TO GO A LITTLE BIT ABOUT TURNING. THIS IS TURNING RADIUS. SO IF YOU LOOK AT THE HORSE AND THE BIKE, THEY'RE SOMEWHAT SIMILAR IN WHAT A TURNING RADIUS IS NEEDED. THEY'RE SAYING THAT -- HERE THEY'RE SAYING THAT IT'S ABOUT 5 FOOT. IF YOU LOOK AT -- IF YOU DO A 5-FOOT RADIUS, AND THIS IS SHOWING HOW SOME CURVES WERE PLACED THERE, BASICALLY THAT RADIUS NEEDS A MINIMUM OF THE 5 FEET OR ELSE YOU BASICALLY CAN'T DO THE TURN WITHOUT SIDESTEPPING, AND THAT'S DAMAGING TO THE TRAIL. CLIMBING TURNS AND SWITCHBACKS, THEY'RE A LAST -- KIND OF A LAST THING YOU GO TO IN TRAIL DESIGN. IF YOU CAN'T KEEP A CONTINUOUS CONTOUR GOING AND FOR SOME REASON YOU HAVE TO DROP OUT OF AN AREA OR RAISE YOUR TREAD LEVEL ALIGNMENT UP AND YOU HAVE TO DO IT IN A SMALL SPACE, YOU KNOW, YOU TURN TO THESE, BUT YOU TRY EVERYTHING YOU CAN TO NOT DO THIS BECAUSE CLIMBING TURNS AND SWITCHBACKS ARE PROBLEMATIC IN THAT THEY HOLD WATER, THEY'RE HARD TO TRAIN. HALFWAY THROUGH THE CLIMBING TURN OR SWITCHBACK, IT'S GOING TO GO REVERSE GRADE ON YOU, WHICH MEANS YOUR CROSS SLOPE GOES FROM AN OUT SLOPE TO AN INSLOPE AND BACK TO AN OUTSLOPE. SO YOU HAVE TO ACCOUNT FOR THAT BY BUILDING DRAINAGE JUST ON EACH SIDE OF THE APEX OF YOUR TURN, AND THAT DRAINAGE SHOULD CROSS AND MEET THE AGAIN. YOU HAVE TO ADD EXTRA DRAINAGE IN THE INTERVALS I SAID BEFORE IN ORDER TO ACCOMMODATE THAT INSLOPING OF THE TREAD THAT WILL HAPPEN NO MATTER WHAT. YOU CAN'T GET A TRAIL TO DRAIN IN THE APEX OF A TURN. YOU HAVE TO DO IT ON EITHER END WHEN IT GOES BACK TO OUTSLOPE. SO THAT'S SOMETHING I CAN EXPLAIN MORE. THAT'S SUPER IMPORTANT IF YOU EVER UTILIZE CLIMBING TURNS AND SWITCHBACKS, YOU HAVE TO PUT THOSE DRAINAGE BEFORE AND AFTER OR THEY'LL FAIL. AND SO WE DO TRY TO AVOID THESE, BUT SOME PLACES JUST BY GEOGRAPHY WE HAVE TO USE THEM. IT REALLY VARIES, BUT YOU TRY NOT TO. I KNOW THAT JIM AND JUSTIN TALKED A LITTLE ABOUT STACKED LOOP TRAILS. THIS IS KIND OF THE SIMPLE VERSION OF IT. EVERYBODY LIKES TO GO IN LOOPS. LOOPS MAKE FOR MORE POSSIBILITIES. YOU HAVE FIGURE EIGHTS. YOU END UP WITH ALL DIFFERENT WAYS YOU CAN INCREASE THE NUMBER OF ALTERNATE ROUTES THAT YOU CAN TAKE EXPONENTIALLY WITH STACKED LOOP SYSTEMS JUST BECAUSE WHEN -- I FIND THAT THEY'RE LESS PERTINENT OUT IN THE WILDERNESS. THEY'RE MORE VALUABLE, SAY, HEAR IN THE PHOENIX AREA WE HAVE A LOT OF PRESERVES THAT ARE COMPLETE WILDERNESS. BUT YOU HAVE PEOPLE WITH JUST A LIMITED AMOUNT OF TIME AND THEY'RE GOING TO GO OUT AND THEY'RE LOOKING FOR ALTERNATIVES TO HOW THEY WENT LAST TIME SO THEY TRY A DIFFERENT LOOP. THE STACKED LOOPS ARE GREAT BUT LESS IMPORTANT FOR LARGE WILDERNESS AREAS WHERE IT'S REALLY A MATTER OF MANY MILES WHERE IT'S A POSSIBILITY TO GO ANOTHER ROUTE. YOU'RE NOT LOOKING FOR THAT SHORT-TERM ALTERNATE TRAIL ALIGNMENT.

SO STACKED LOOPS ARE DEFINITELY A MUST. NOBODY WANTS TO GO ONE WAY AND TURN AROUND AND COME BACK. IT IS A DIFFERENT VIEW COMING BACK, YOU'VE GOT TO ADMIT. SIMPLE THINGS. VEGETATION CLEARANCE OBVIOUSLY HAS TO BE HIGHER FOR HORSES. WE HAVE THIS SAYING, THE HEIGHT OF VEGETATION SHOULD BE EQUAL TO A TALL HORSE WITH A TALL RIDER WITH A TALL HAT. SO THAT'S YOUR MINIMUM OF WHAT YOU WANT. NOBODY WANTS TO BE DUCKING. AND SO, A LARGE VEGETATION CLEARANCE FOR EQUESTRIANS AS WELL AS A SIDE-TO-SIDE DISTANCE BECAUSE YOU HAVE A LARGE -- YOU WANT AREA TO MOVE TO THE SIDE WITHOUT DESTROYING VEGETATION. SO YOU'VE GOT TO HAVE A SHOULDER OF SEVERAL FEET THAT ALSO GETS PRUNED LOW -- TO A LOW LEVEL AND IT GIVES YOU BETTER SIGHT DISTANCE AS WELL, WHICH WE'LL TALK ABOUT. PACK ANIMALS, 5-FOOT WIDE JUST FOR THE MINIMUM. SO YOU DON'T TRIM VEGETATION RIGHT TO THE MINIMUM. YOU TAKE IT GREATER BECAUSE IT GROWS BACK AND IF YOU DO IT TO THE MINIMUM, IMMEDIATELY IT'S BACK IN THE TRAVELWAY. SO YOU WANT TO TAKE YOUR VEGETATION SEVERAL FEET WIDER THAN WHAT YOUR ACTUAL USAGE AREA IS TO BUY TIME FOR IT TO GROW BACK WITHOUT NEEDING TO BE WORKED AGAIN. SO HERE'S ONE OF THE MOST IMPORTANT PARTS OF TRAIL DESIGN IS SIGHT LINES. AND SIGHT LINES, ESPECIALLY IN THESE DAYS, THE MOUNTAIN BIKERS ARE MORE IMPORTANT THAN EVER. SIGHT LINES WEREN'T AS IMPORTANT WHEN IT WAS JUST EQUESTRIANS AND HIKERS BECAUSE NOBODY IS COMING AROUND A CURVE AT 30 -- THERE'S DEFINITELY GREATER NEED FOR IT NOW. AND BECAUSE EVERYONE WANTS TO USE EVERY TRAIL, WE MIGHT AS WELL DESIGN IN LONG SIGHT LINES TO TRAILS. AND THAT MEANS NOT JUST HAVING THE TRAIL SUDDENLY TURN AROUND A BUSH AND GO ANOTHER WAY WHERE NOBODY CAN SEE EACH OTHER COMING. SO THAT DOESN'T MAKE THE TRAIL BORING. IT JUST MEANS THAT WE USE SOMETHING LIKE I CALL CONTINUOUS ARC. WE NEVER MAKE CONTINUOUS TRAILS. THAT'S BORING. IT'S ALWAYS ARCING. NOT WAVY CURVES. BUT ARC IS AN IMPORTANT ASPECT TO THE DESIGN AS WELL. AND THAT CAN STILL INCORPORATE LONG SIGHT LINES BECAUSE AS LONG AS YOUR ARC IS A REAL BROAD ARC, NOT A TIGHT ARC, YOU HAVE VISIBILITY. I DEFINITELY LIKE TO NOT JUST HAVE LONG STRAIGHT LINES. EVEN IF YOU HAVE THAT POSSIBILITY, IT'S JUST NOT THAT INTERESTING FOR THE USERS. WE TALKED ABOUT THE -- HORSES, A LOT OF TIMES THEY WILL CAUSE TRENCHING OR TROUGHING. BERM FROM FEET KICKING IT UP AND IT RESTING ON THE EDGE, THEREFORE STOPPING THAT CROSS-DRAINAGE THAT WE WANT. SO A LOT OF TIMES, AGAIN, THIS IS ANOTHER THING ABOUT NOT USING FILL. WHEN YOU CUT THIS OUT, LIKE A LOT OF TIMES PEOPLE WOULD -- THIS DRAWING ISN'T EXACTLY RIGHT BECAUSE WHERE THEY SHOW THE CUT LINES OF WHERE THEY WOULD DO IT AND THEN THEY'RE SHOWING BETWEEN THE HORSE'S FEET, THERE'S SOME SPACE TO MAKE A NICE CLEAN OUTSLOPE WOULD HAVE REQUIRED FILL. IT WILL GO RIGHT

BACK TO WHAT IT WAS EVEN WITH A SMALLER BERM. SO REALLY WHAT YOU NEED TO DO, YOU NEED TO TAKE THE LOWEST POINT OF YOUR TRAIL AND -- WHICH WOULD BE -- I DON'T KNOW IF YOU CAN SEE MY ARROW, BUT IT WOULD BE DOWN HERE, AND RECUT THE TRAIL TO AN OUTSLOPE AT THE LOWEST POINT. DON'T RELY ON FILL BECAUSE FILL DISAPPEARS. SO THAT'S A SUPER IMPORTANT ASPECT. YOU GO FILLING STUFF BACK IN. YOU'RE NOT REALLY FIXING IT. YOU'RE JUST BUYING TIME UNTIL IT WASHES OUT AGAIN. AND AGAIN, I'M NOT TALKING ABOUT HOLES WHERE A BOULDER CAME OUT OR SOMETHING THAT YOU HAVE TO FILL. I'M TALKING ABOUT JUST THE RESULTS OF OVERALL THE TREAD SHOULD BE PLACED ON NATIVE COMPACTION, WHICH IS THE GROUND UNDER THE LOOSE DIRT THAT IS COMPACTED, BEEN THERE FOR 10,000 YEARS. IT'S VERY HARD. WE CAN'T REPRODUCE THAT. WE'RE NOT GOING TO GO OUT IN THE WILDERNESS WITH A DOUBLE-DRUM COMPACTER OR SOMETHING LIKE THAT TO GET IT, SO WE RELY ON WHAT IS ALREADY IN THE GROUND. THAT'S NATIVE COMPACTION. AND WE WANT TO TAKE ADVANTAGE OF THAT. THE MORE YOU TAKE ADVANTAGE OF THAT, THE MORE SUSTAINABLE THE TRAIL WILL BE. AND DEFINITELY FILL IN ANY ENVIRONMENT IS PROBLEMATIC. WELL, HERE'S A SPOT THAT YOU HAVE LIKE TWO TRAILS. ONE IS KIND OF BEEN ABANDONED NOW AND THEY'VE MOVED OVER OUT OF THIS TROUGH BECAUSE IT'S A TROUGH AND IT'S LESS COMFORTABLE. SO AGAIN, ROCKS BEING USED TO LINE IT. PROBABLY NOT THAT GREAT OF AN IDEA. I WOULD RATHER SEE, IF I CAME IN ON THIS TREAD TO TRY TO FIX IT, I WOULD BLOW IT OUT TO THE TOTAL WIDTH AND MAKE IT PERFECTLY SMOOTH AND GET RID OF THE OUTSLOPE THAT'S HOLDING WATER IN BECAUSE THERE'S NO REASON I WANT WATER TO STAY ON THE TRAIL. SO SAME THING WITH TRAIL CREEP. I DON'T KNOW IF YOU REMEMBER THAT I WAS TALKING ABOUT THE TREAD SHOULD BE 2 TO 3% OUTSLOPE. IF YOU GET TO A 5% OUTSLOPE, WHICH IS WITHIN THE SPEC RANGE OF WHAT THE FOREST SERVICE CALLS FOR, YOU THEN GET TO TOO STEEP OF A SLIDE ANGLE AND IT'S GOING TO PUSH THE HORSES OUT FARTHER AND YOUR TRAIL IS GOING TO START WIDENING. SO LET'S TRY TO AVOID TOO STEEP OF A CROSS-SLOPE ON YOUR TRAIL, AND THAT'S WHY 2 OR 3, THEY CAN USE A WHOLE TRAIL, BUT WHEN IT GETS STEEP, THEY START MOVING OUT HERE TO THE OUTER EDGES AND PRETTY SOON YOU'VE GOT TRAIL CREEP AND THE TRAIL IS GETTING WIDER AND WIDER AND THERE'S ALL THIS UNUSED PART. A LOT OF THESE ON EXISTING TRAILS ARE MAINTENANCE ISSUES THAT EVERYONE KNOWS THAT NO ONE PUTS NEAR ENOUGH TIME OR MONEY INTO MAINTENANCE. THEY WANT THE GLORY OF NEW TRAILS. WE HAVE A LOT OF TRAILS IN OUR INVENTORY IN THE UNITED STATES AND WE NEED TO BE ADDRESSING HOW TO JUST KEEP THEM GOING WITHOUT BUILDING NEW ONES, HOW TO FIX WHAT THERE IS OUT THERE. AND WE DEAL WITH A LOT OF TRAILS IN THIS AREA THAT ARE 80 TO 100 YEARS OLD BUILT BY THE CCC. AND FRANKLY, A LOT OF THEM ARE BEYOND RESTORATION AND THEY NEED A NEW -

- THAT TRAIL AT SOME POINT IS -- THERE'S NO WAY TO FIX IT. WE DO CERTAIN THINGS TO IMPROVE IT, BUT YOU CAN'T MAKE IT RIGHT IF THAT'S FAR GONE. SO YOU REALLY NEED TO KEEP UP WITH YOUR MAINTENANCE ON WHAT YOU'VE GOT. WE HAVE COMMUNITIES HERE WE BUILT TRAIL SYSTEM FOR AND WE DO MAINTENANCE EVERY TWO MONTHS. THAT KEEPS THE TRAILS PERFECT. VEGETATION GROWING IN, VARIOUS THINGS LIKE THAT, THAT SHOULD BE ADDRESSED AND STORM DAMAGE. SO ANY OF YOU PLANNERS OUT THERE, MAKE SURE THAT YOU LOBBY YOUR ADMINISTRATORS OR MAINTENANCE MONEY AND DON'T BE AFRAID TO CONTRACT MAINTENANCE. IT'S A ONE WAY TO KNOW THAT IT'S GETTING DONE RIGHT AND GETTING DONE CONTINUOUSLY. BECAUSE FOR ALL THAT I LOVE THAT VOLUNTEERS CAN DO, WHEN YOU HAVE A CHANGING GROUP OF PEOPLE AND CHANGING IDEAS OF WHAT IS RIGHT, IT DOESN'T QUITE NECESSARILY GET THE JOB DONE LIKE IT WOULD FROM A CONTRACT GROUP, IF YOU HAVE THAT AVAILABLE IN YOUR AREA, I STRONGLY SUGGEST. IT'S NOT THAT EXPENSIVE TO HAVE BIMONTHLY OR BIENNIAL MAINTENANCE DONE. SO, AGAIN, WE'RE GOING TO DEAL WITH SOME OF THE BACKCOUNTRY STOCK ISSUES. ONE OF THEM IS JUST THE FACT THAT WE HAVE LIKE THESE CERTAIN SITUATIONS, LIKE ESPECIALLY WHEN YOU HAVE A PACK TRAIN, THAT IT'S HARD TO CONTROL WHAT THE HORSES ARE DOING. BUT AGAIN, THESE HORSES JUST LIKE YOU ARE TRYING TO PICK THEIR WAY UP THE SLOPE AND FIND WHAT IS THE EASIEST WAY TO WALK. EVERYBODY IS LOOKING FOR THAT. AND IF THERE'S TOO MANY OBSTRUCTIONS, IT'S GOING TO DRIVE THEM OUT INTO UNUSED, INTO ANYWAY ACTIVE GROUND AND IT'S GOING TO START DESTROYING VEGETATION AND WIDENING THE TRAIL. SO IF YOUR TRAIL'S NOT IN GOOD SHAPE, YOU CAN'T BLAME THE USERS FOR TRYING TO CREATE A NEW TRAIL. SO KEEP THE TRAILS IN GOOD SHAPE, THAT'LL GO AWAY. HERE WE HAVE ANOTHER SITUATION WHERE THE TRAIL REALLY ISN'T THAT BAD. EVERYONE'S IN A MEADOW. WE LOVE TO BE ON HORSES OUT IN THE MIDDLE OF A MEADOW. HORSES WANDER, BUT THEY'RE GOING TO START CREATING A NEW PATH AND WE'RE GOING TO END UP WITH SOMETHING LIKE THIS. AND THIS IS ONE OF THE MOST UNSIGHTLY AND EROSIIVE ASPECTS OF TRAILS IN THE WILDERNESS IS TRAIL BRAIDING. PARTLY THIS IS DUE TO THE TRAIL NOT BEING PLACED IN A PLACE, IN A LOCATION ORIGINALLY WHERE BRAIDING WOULDN'T BECOME AN ISSUE BECAUSE IT WAS PLACED RIGHT. MEADOWS REALLY SHOULD HAVE A TRAIL AT THE VERY TOP EDGE WHERE THEY MEET THE TREES, NOT RUN THROUGH THE MIDDLE OF THEM. IT'S BECAUSE THEY'RE FLATTER, THEY'RE MOIST. THEY'RE GOING TO END UP TROUGHING. HOW ARE WE DOING, CANDACE? YOU THERE? CANDACE.

>> I AM, I AM HERE. SORRY, I HAD TO UNMUTE MYSELF.

>> OKAY. HOW ARE WE DOING?

>> WE'RE FINE. YOU CAN KEEP GOING. ATTENDEES ARE REALLY APPRECIATING YOU STILL FINISHING YOUR PRESENTATION. WE'RE CAPTURING IT IN THE RECORDING. SO YOU JUST KEEP GOING UNTIL YOU FINISH.

>> ALL RIGHT. THANK YOU. WELL, THIS IS NOT A BIG NATURAL BARRIER, BUT AGAIN DESIGN IS EVERYTHING ABOUT THIS. DON'T DESIGN TRAILS IN A WAY THAT PEOPLE ARE OBVIOUSLY JUST GOING TO CUT THEM. YOU CAN HAVE A MEANDERING TRAIL, BUT MAKE SURE THE MEANDER IS BACK BY LIKE VEGETATION OR SOME KIND OF CONTROL POINTS THAT WILL KEEP THE ANIMALS FROM WANTING TO GO DIFFERENT WAYS. JUST LIKE IN THE MEADOW, IF YOU GO UP AT THE TOP EDGE, YOU CAN GET A MUCH MORE DISTINCT TRAIL ON THE TOP EDGE OF A MEADOW. HERE YOU HAVE MEANDER FOR -- MEANDER MAKES IT INTERESTING BUT IT ALSO JUST OPENS UP THIS CAN OF WORMS OF WHAT PEOPLE MIGHT DO OR AN ANIMAL ON ITS OWN MIGHT DO JUST, OH, THERE'S A TRAIL, I'M JUST GOING TO CUT ACROSS. SO THIS ISN'T A REAL GOOD NATURAL BARRIER, BUT IT'S SOMETHING. BUT REALLY THAT TRAIL DIDN'T EVEN NEED TO HAVE THAT MUCH MEANDER IN IT. OTHERWISE, YOU REALLY HAVE TO DESIGN OUT THE ABILITY FOR PEOPLE TO CUT TRAILS. EVEN WITH LIKE SWITCHBACKS, IF YOU STACK THEM RIGHT ABOVE EACH OTHER, PEOPLE WILL DROP STRAIGHT DOWN TO THE NEXT SWITCHBACK AND CREATE NEW TRAILS, SO I OFFSET THEM. IF YOU OFFSET THEM, THERE'S NO ADVANTAGE TO DROPPING DOWN BECAUSE THE NEXT ONE'S OVER TO THE RIGHT OR TO THE LEFT. SO YOU WANT TO TRY TO OFFSET YOUR SWITCHBACKS TO NOT MAKE IT ANY ADVANTAGE TO BE RUNNING STRAIGHT DOWN THE HILL AND CATCHING THE NEXT ONE. STACKED RIGHT ON TOP OF EACH OTHER, IT MAKES A LOT OF PEOPLE TRY TO JUST SHOOT RIGHT THROUGH THE MIDDLE ON HORSES OR ON FOOT, WHATEVER, THEY'LL DO THAT. AND SO A LOT OF MY DESIGNING IS AROUND JUST SEEING AHEAD OF TIME WHAT'S GOING TO HAPPEN IN THE FUTURE AND THEN IF PEOPLE ARE GOING TO GO, OH NO, THAT'S MUCH SHORTER TO JUST GO THAT WAY. I'M GOING TO GO THAT WAY. SO YOU HAVE TO BUILD INTO YOUR DESIGN TO NOT ALLOW THAT AND MAKE IT DIFFICULT. JUST MAKE IT THE LAYOUT OF THE TRAIL IS, IT WOULD BE NOT ADVANTAGEOUS TO DO THAT. AND THAT'S AN IMPORTANT PART. THIS IS A SPOT WHERE ACTUALLY THE TRAIL WAS TIGHTER IN AND IT KIND OF BECAME MUDDY AND WHATEVER. AND SO THEY SWUNG OUT AND MEANDERED IT GREATER TO TRY TO OVERCOME IT, BUT A FLAG IN A POST IS NEVER GOING TO STOP THAT FROM COMING BACK AGAIN. DESIGN WOULD HAVE TAKEN CARE OF THIS. AND UNFORTUNATELY, THERE'S TENS OF THOUSANDS OF MILES OF TRAIL IN THE U.S. THAT WERE NEVER DESIGNED, THAT PEOPLE JUST ROAD THEM OR THEY WALKED THEM. THEY WERE STARTED FROM VARIOUS REASONS, MINERS, WHOEVER GOING BACK INTO THE BACKCOUNTRY. NEW TRAILS DON'T HAVE TO HAVE THESE AND

NEW TRAILS CAN BASICALLY IF YOU HAVE A CONSCIENTIOUS DESIGNER, THEY'RE GOING TO KNOW HOW TO DO IT TO NOT INCLUDE SPOTS THAT BECOME BAD. AND IT'S A NUANCE OF DESIGN, BUT IT'S ONE OF THE MOST IMPORTANT ONES IS KNOW HOW TO DESIGN. DESIGNING ISN'T JUST WALKING OUT AND PICKING A ROUTE THROUGH THE FOREST. IT HAS A HUNDRED OR HUNDREDS OF NUANCES, ELEMENTS, WHATEVER YOU WANT TO CALL THEM THAT ARE ALL ABOUT PRESERVING THE NATURE AROUND IT, GIVING YOU THE BEST VIEW, KEEPING OTHER PEOPLE FROM HAVING THE VIEW OF THE TRAIL THAT, YOU KNOW, OF A CHOPPED-UP HILLSIDE. GOING TO FEATURES. GOING TO SEE PARTICULARLY NICE SPECIMENS OF TREES OR PLANTS THAT ARE IN AN AREA. THOSE ARE ALL ELEMENTS THAT SHOULD BE BROUGHT IN TO THE DESIGN BUT YOU TAKE ALL THESE DIFFERENT ASPECTS LIKE WHERE TO CROSS THE STREAM AND THEY'RE WHAT WE CALL CONTROL POINTS. THERE'S A TWO-MILE TRAIL COULD HAVE TEN CONTROL POINTS. THAT'S GOING TO DICTATE A LOT WHERE THE TRAIL NEEDS TO GO BASED ON WHETHER THERE'S AN IMPEDIMENT LIKE A CLIFF OR SOMETHING LIKE THAT OR YOU'RE JUST TRYING TO TAKE IN A FEATURE WHERE YOU WANT TO BRING IN EXCEPTIONALEXCEPTIONALEXCEPTIONAL SPECIMENS AND FEATURES OF YOUR AREA. YOU'RE TRYING TO LEAD PEOPLE THROUGH THE DESTINATION OR THROUGH THE EXPERIENCE WITH NICE VIEWS, THE GREATER VIEWSHED, SEEING ALL THESE DIFFERENT THINGS, BUT YOU'RE ALSO HAVING TO INCLUDE WITH THAT PAYING GREAT ATTENTION TO WHAT'S THE GEOLOGY, OH, THIS AREA GOES THROUGH A BIG SOFT MARSHY MEADOW TO GET TO THIS ONE FEATURE. YOU MIGHT HAVE TO ABANDON THAT FEATURE JUST TO MAKE THE TRAIL SUSTAINABLE. AND I TELL YOU, THE SUSTAINABILITY OF THE TRAIL IS MORE IMPORTANT THAN THE FEATURE IF IT, YOU KNOW, IF IT ISN'T JUST SOME AWESOME FEATURE THAT YOU HAVE TO GET TO. AND WE DO HAVE WAYS OF DEALING WITH SOFT SOILS AND STUFF. BUT, I MEAN, TURNPIKES ARE A GREAT WAY. I'VE BUILT TURNPIKES THAT ARE A QUARTER MILE LONG JUST TO GET THROUGH A WET AREA BECAUSE YOU HAD TO GO THROUGH THAT WET AREA TO GET THROUGH THAT VALLEY OR SOMETHING. SO THERE ARE STRUCTURES AND SUCH THAT CAN MITIGATE SOME OF THE PROBLEMS, THE GEOLOGY. BUT FIRST TRY TO JUST DO IT WITHOUT ANY STRUCTURES, DO IT WITHOUT SWITCHBACKS, TRY TO MAKE A DESIGN THAT DOESN'T HAVE TO INCLUDE THOSE. SWITCHBACKS ARE A STRUCTURE IN A WAY AND THEY, AGAIN, YOU JUST -- YOU TRY TO AVOID THEM. THEY'RE MORE PROBLEMATIC AND MORE MAINTENANCE-HEAVY. THEY REQUIRE MORE MAINTENANCE. HERE'S SOME, YOU KNOW, BEST PRACTICES REMINDERS. EVERYBODY, YOU KNOW, KNOWS ABOUT TRYING TO STAY OFF WET TRAILS. I'LL TELL YOU, MOUNTAIN BIKES ARE THE WORST ON WET TRAILS BECAUSE UNLIKE HORSES THAT MAKE A STEP HERE AND A STEP THERE AND THEY BASICALLY WHAT WE CALL POST HOLING, LEAVE LITTLE MARKS, THOSE BECOME PUDDLES, BUT MOUNTAIN BIKES WILL LEAVE A



LONG LINEAR LINE, LONGITUDINAL LINE DOWN THE MIDDLE OF THE TRAIL, WHICH THEN ATTRACTS WATER TO RUN DOWN THE MIDDLE OF THE TRAIL AND NOT CROSS IT LIKE WE'RE TRYING TO HAVE IT DO. SO THESE ARE IMPORTANT THINGS TO AVOID FOR DAMAGING THE TRAIL. STAY ON DESIGNATED, LIKE, OKAY, IF YOU WERE RIDING AND YOU CAME ACROSS THAT BRAIDED AREA I SHOWED PREVIOUSLY, IT'S VERY IMPORTANT TO JUST KEEP -- IT DOESN'T MATTER THERE'S ALL THESE OTHER TRAILS. STAY ON THE MAIN TRAIL AND IF YOU'VE GOT A PACK STRING, TRY TO MOVE ON THROUGH SO THEY ALSO STAY ON IT. DON'T GIVE THEM TIME TO MEANDER AND GO AROUND DAMAGING MORE STUFF. JUST CONTINUE THROUGH THOSE BUT ON WHAT LOOKS LIKE THE ORIGINAL TRAIL. IT STILL HAS TO BE REPAIRED, BUT IF PEOPLE WEREN'T USING ALL THE BRAIDS, THEN THEY WOULD SLOWLY GO BACK TO NATURE. OBVIOUSLY, CLEAR AND POLITE COMMUNICATION WITH OTHER TRAIL USERS. WE HAVE A LOT OF CONFLICTS THESE DAYS. IT NEVER HURTS TO NOT ALIENATE THE OTHER PERSON, EVEN IF THEY ARE NOT THE NICEST PERSON. SO TRY TO BE THE ONE WHO, YOU KNOW, IS RESPONSIBLE AND TREAT PEOPLE, YOU KNOW, WITH RESPECT. IT GOES A LONG WAYS TOWARDS HELPING THE DIFFERENT USERS COMMUNITIES TO GET ALONG AND ENJOY. WE SHOULDN'T HAVE -- WHEN WE'RE GOING OUT ON TRAILS, THE LAST THING WE WANT IS CONFLICT. WE WANT RESOLVE FROM CONFLICT. THAT'S WHY WE GO ON TRAILS. SO LET'S TRY TO DO THE EXTRA EFFORT AND ENCOURAGE THAT WITH YOUR DISTRICTS OR YOUR AREAS FOR PEOPLE TO DO THAT. I CAN NEVER GO FAR ENOUGH TO SAY THAT. AND WE DEAL WITH IT ALL THE TIME. BUILDING NEW TRAILS AND REPAIRING TRAILS, YOU GET A LOT OF PUSHBACK JUST BECAUSE PEOPLE LIKE EVERYTHING HOW IT ALREADY IS AND NO ONE WANTS -- THEY ALL HAVE THEIR OWN IDEAS OF WHAT'S BETTER. AND SO MY CREWS ARE ALWAYS ULTIMATELY POLITE EVEN IN THE FACE OF NASTY PEOPLE. WHEN YOU'RE TYING YOUR HORSE, IF IT'S JUST VERY BRIEFLY, IT CAN BE TIED TO A SUBSTANTIAL TREE LIKE A 12-INCH DIAMETER OR SOMETHING, BUT DON'T LEAVE IT THERE FOR HALF A DAY OR EVEN LIKE AN HOUR. IT'S GOING TO START KICKING THE ROOTS AND KILLING THE TREE, THE BARK WITH THE ROPE. THERE'S SO MANY BAD ASPECTS OF THIS. AND IT'S A TEMPORARY, YOU KNOW, THING TO DO IS TO TIE A HORSE DIRECTLY TO A TREE ONLY FOR MOMENTS BUT WHILE YOU DO SOMETHING AND THEN, YOU KNOW, MOVE ON, BUT DON'T LEAVE THEM THAT WAY. YOU WANT TO USE A HIGH LINE AND THE HIGH LINE'S GOT TO BE TIED TO A GOOD-SIZED TREE IF YOU'RE GOING TO LEAVE THEM FOR A LONGER PERIOD. ANOTHER THING I LIKE TO POINT OUT IS, YOU KNOW, TO ENCOURAGE USERS, EQUESTRIAN USERS TO NOT -- A LOT OF TIMES WHEN YOU'RE IN THE WILDERNESS AND YOU'RE BRINGING YOUR CERTIFIED WEED-FREE PALLETS WHICH A LOT OF THE FORESTS REQUIRE NOW. WE DON'T WANT INVASIVE PIECES HAPPENING. ONE OF THE THINGS TO DO IS A LOT OF TIMES WITH MY WORK IS I HAVE TO USE HORSES. AND WHEN I'M USING THEM IN MEADOWS AND

STUFF LIKE THAT I HOBBLE THEM ONE AT A TIME AND LET THEM FEED, HOBbled AND DON'T LET THEM OUT WHERE THEY'LL WANDER AND JUST DO IT INDIVIDUALLY AND LET ONE WANDER AROUND WITH HOBbLES AND THEN LET THE NEXT ONE OUT. IT'S MUCH BETTER ON THE VEGETATION. AND ANOTHER THING, REPORT DANGEROUS TRAIL CONDITIONS. OBVIOUSLY, IF YOU SEE SOMETHING, LET SOMEBODY KNOW SO THAT THIS STUFF CAN BE TENDED TO -- WE DON'T KNOW HOW LONG IT'LL BE UNTIL SOMEBODY CAN GET OUT AND DO SOMETHING, BUT AT LEAST THEY KNOW ABOUT IT AND THE LAND MANAGER CAN TRY TO ADDRESS IT BECAUSE PEOPLE DIE BECAUSE OF BAD TRAIL CONDITIONS. IT HAPPENS. IT'S NOT IRREGULAR. IT HAPPENS. AND MAYBE SOMEBODY COULD HAVE SAVED SOMEBODY BY TELLING THEM THAT THERE WAS, YOU KNOW, NOW A SLOPE THAT JUST DROPPED OFF. AND I'VE DEALT WITH PLACES ON THE PACIFIC CREST TRAIL WHERE YOU COULDN'T TURN THE HORSE AROUND. I MEAN, YOU'RE ON THE SIDE OF A BIG, YOU KNOW, SLOPE AND THERE'S NO ROOM AND THE TRAIL WAS GONE. AND OTHER PEOPLE HAVE BEEN THROUGH THERE BUT NOBODY REALLY REPORTED IT. SO I'VE HAD TO SIT THERE FOR EIGHT HOURS DIGGING A NEW TRAIL JUST TO GET THE HORSE THROUGH BECAUSE NO ONE KNEW THAT THAT HAD HAPPENED. SO THAT'S ANOTHER GOOD THING. HERE'S A VIEW OF SOME MUDDY STUFF. AND I'M NOT TALKING ABOUT STAYING OFF WET TRAILS WHEN THERE'S JUST SOME LITTLE MUD HOLE HERE. IT'S WHEN THE WHOLE TRAIL IS WET. THIS KIND OF STUFF, IF IT'S JUST IN ONE AREA, THAT'S UNAVOIDABLE. THERE'S WET SPOTS EVERYWHERE. ANOTHER THING I WANTED TO ADDRESS, I DON'T THINK I HAD A SLIDE FOR IT, BUT I KNOW BACK EAST I'VE DEALT WITH A LOT OF PEOPLE HAVING PROBLEMS WITH CROSSINGS AND LIKE STREAM CROSSINGS. THAT'S ANOTHER CONTROL POINT IN DESIGN. AND SO, YOU HAVE TO GO UP AND DOWN THE STREAM BED AND FIND A HARDENED CROSSING, LIKE A PLACE WHERE THE LIMESTONE COMES UP TO THE SURFACE, SOME KIND OF THING IN THAT STREAM THAT MAKES THAT ABILITY TO CROSS AND THEN DESIGN YOUR TRAIL TO THAT CROSSING. DON'T DESIGN YOUR TRAIL AND THEN, OH, HERE'S A CREEK. LET'S JUST DROP THROUGH HERE BECAUSE WE WANT TO GO THAT WAY. IT CAN'T BE LIKE THAT. YOU HAVE TO FIRST SCOPE OUT THAT BEFORE YOU GOT NEAR TO THE CREEK. YOU SHOULD BE FIGURING OUT A WAY. AND WHEN YOU DO, DON'T JUST, AGAIN, FALL-LINE IS WRONG, PERIOD. DON'T FALL-LINE STRAIGHT DOWN THE SLOPES AT THE SIDES OF A CREEK INTO IT AND COME BACK OUT. ALWAYS COME FROM UPSTREAM AT LIKE A 45-DEGREE ANGLE OR LESS AND DROP DOWN TO YOUR STREAM GOING FROM UPSTREAM TO DOWNSTREAM AND THEN WHEN YOU'RE IN THE CREEK CROSSING, THEN DOWNSTREAM TO BACK UPSTREAM ON THE OTHER SIDE. DON'T DO CROSSINGS FROM DOWNSTREAM UPSTREAM BECAUSE YOU'RE JUST INVITING THE WATER TO DIVERT AND START GOING UP YOUR TRAIL. SO THAT'S ANOTHER IMPORTANT ASPECT. AND A LOT OF THE WATER CROSSINGS I'VE SEEN BACK EAST HAVE BEEN THAT'S A RESULT OF JUST

FALL-LINE ENTRY AND EXITS. THEY DROP STRAIGHT IN. IT BECOMES A BIG GASH AND NOT A PRETTY SIGHT. SO SEE WHAT I'VE GOT LEFT HERE. MATERIALS TRANSPORT. THIS IS GREAT, ONE OF MY FAVORITES BECAUSE WE USE HORSES SO MUCH OR WE HAVE THAT A LOT OF WILDLANDS, IT'S HELICOPTER OR HORSE. OFTENTIMES A HORSE IS A BETTER OPTION, DEFINITELY COST-WISE. SO HELICOPTERS ARE NOT UNREASONABLE. IF YOU'RE THINKING ABOUT TRYING TO GET TO SOME HARD-TO-GET-TO PLACES. ONE DAY THIS YEAR WE HELICOPTERED IN 1,000 POUNDS OF ROCK IN ONE DAY WITH ONE HELICOPTER. IT'S NOT NOT COST-EFFECTIVE NECESSARILY. IF YOU NEED MATERIALS TO GET BY SOME UNAVOIDABLE AREA IN A TRAIL THAT'S GOING TO BE A PROBLEM, USING HELICOPTERS TO DROP MATERIALS IS A REALLY GOOD WAY, BUT FOR THE LESSER STUFF LIKE IN THIS CASE WE'RE HAULING PLANKS TO BUILD THIS BRIDGE SO THAT THE HORSES COULD GET ACROSS THAT WETLAND. AND IF YOU SEE ON THEIR PACK SADDLES, WE HAVE -- ANY OF YOU FAMILIAR WITH IT, THOSE ARE APPLE-PICKING BAGS. AND IT TURNS OUT THE APPLE-PICKING BAGS ARE THE PERFECT WAY TO HAUL FOR APPLE. AND SO WE USE THE WEIGHT AMOUNT ON THEM IS PERFECT. THEN YOU CAN POP THEM RIGHT ON THE HORSE. YOU DON'T HAVE TO LIFT OFF. THEY'RE ABOUT 65 TO 85 POUNDS. IN THIS CASE WE'RE BUILDING TURNPIKETURNPIKES, HORSE PACKING AND 13 YARDS OF GRAVEL TO MAKE THESE TURNPIKES WORK THROUGH WET AREAS. SO AGAIN, LIKE RANDY WAS TALKING ABOUT WITH THE FIRES, A LOT OF TIMES THEY'RE THE ONLY POSSIBILITY AND JUST BY HAVING SOME, YOU KNOW, EFFECTS -- NEGATIVE EFFECTS ON TRAILS, THEY HELP MUCH MORE ARE AND TOTALLY USEFUL FOR JUST HARD-TO-GET PLACES AND MAKING THE STRUCTURES YOU NEED TO MITIGATE PLACES AND DESIGN WHERE YOU COULDN'T ACTUALLY JUST FIND PERFECT GROUND. AND THAT HAPPENS. THAT'S JUST PART OF THE GAME. SO I THINK THAT'S ABOUT IT FOR NOW. THAT'S WHAT I'VE GOT. BUT ANYTHING WE DIDN'T TOUCH ON, ANYBODY WANTS TO ASK ME QUESTIONS ABOUT WILDERNESS, ANY KIND OF QUESTION, TRAIL DESIGN QUESTIONS, I CAN HELP ANSWER, I WOULD BE GLAD TO.

>> WONDERFUL. THANK YOU SO MUCH. I'M GETTING BACK TO MY CLOSING SLIDE HERE FOR EVERYONE. I APOLOGIZE. GETTING IT BACK UP HERE. OKAY. HOLD ON. OKAY. SO YOU GUYS SHOULD BE ABLE TO SEE MY RESOURCES SLIDE. OBVIOUSLY YOU'RE NOT GOING TO BE ON THIS SLIDE TOO LONG BECAUSE WE'RE GOING TO BE ENDING THE WEBINAR HERE, BUT YOU ALL WILL BE GETTING A PDF WITH CLICKABLE LINKS FOR THE WEBSITES YOU SEE HERE AND THERE ARE MORE ON THE WEB PAGE, WHICH IS THE LINK AT THE VERY TOP. I JUST WANT TO THANK ALL OF THE PRESENTERS AGAIN. THANK YOU TO THE ATTENDEES, ESPECIALLY THOSE WHO WERE ABLE TO STICK AROUND FOR 30 MINUTES. I'M SORRY. I ALSO WANT TO THANK OUR SPONSOR OF THE WEBINAR RHINO FOR MAKING THIS WEBINAR AND THE LEARNING CREDITS TO EVERYONE.

AND I HOPE YOU GUYS CAN JOIN US FOR FUTURE WEBINARS OFFERED IN OUR ADVANCING TRAILS WEBINAR SERIES. WE'LL BE DOING THREE TO FOUR WEBINARS EVERY MONTH FOR THE NEXT SEVERAL MONTHS AS PEOPLE ARE STUCK AT HOME DUE THE COVID-19. THE MAJORITY OF THEM WILL BE FREE IF NOT ALL OF THEM. SO I HOPE YOU GUYS CAN ATTEND. THANK YOU, EVERYONE, AGAIN, AND I HOPE EVERYONE HAS A GREAT REST OF YOUR DAY AND HAPPY TRAILS.

**END OF WEBINAR**