Ecosystem Functions and Processes (EF)

EF(1): What ecological attributes, particularly those unique to the region, would be affected by roading of current unroaded areas?

There are no plans to build roads within inventoried roadless areas. The ecological attributes of these areas will continue to be protected.

EF(2): To what degree do the presence, type, and location of roads increase the introduction and spread of exotic plant and animal species, insects, diseases, and parasites? What are the potential effects of such introductions to plant and animal species and ecosystem function in the area?

The presence of roads increases the risk of spread of existing and new noxious weeds to the Forests, Grassland and adjacent ownerships. The higher the assigned maintenance level and subsequent frequency of road maintenance, the greater the increase of the chances for spread of many exotic (noxious) plants into new areas. These noxious weeds will often displace existing native species. The result is that noxious weeds can dramatically alter ecosystem function, and road systems provide a major opportunity for invasion and spread of weeds. Native plants and animals are generally reduced by the presence of weeds.

To deal with the problem of noxious weeds negatively affecting naturally functioning ecosystems, the ARP completed an Environmental Assessment to treat existing noxious weeds in 2003. The decision to continue noxious weed treatment will deal with the problems of spreading weeds due to the existence and use of road systems.

EF(3): To what degree do the presence, type, and location of roads contribute to the control of insects, diseases, and parasites?

Monitoring for mortality from insect and disease agents are generally accomplished by annual pest detection flights. Walking inventories on suitable lands for timber harvest measure weaker, slower acting vectors. Roads are neutral for aerial detection but useful for the walking inventories. The presence of roads allows access to the forest for many types of treatment, including, mechanical, chemical, and burning.

EF(4): How does the road system affect ecological disturbance regimes in the area?

The disturbance these roads cause has already occurred in the construction of the road, and all are well-established roads. These existing roads have already committed the disturbance and now the effects of the presence, use and maintenance of the roads are the concern.

The most common disturbance regimes on the Arapaho and Roosevelt National Forest are fire, wind, drought and insects and disease in the coniferous forest types. These regimes are interrelated since drought often leads to increased incidences of fire and outbreaks of insects and disease. Wind couples with disease-weakened root systems to cause trees to “blow-down”.

Wind combines with fire to create larger patch sizes (openings in continuous forest). Fire is thought to be the most significant disturbance regime and many past large stand replacing fires are found on all ranger districts of the Forest.

Roads introduce insects and disease when these (# other word?) vectors are brought to the forest from other ecosystems by motor vehicles. Most recently, researchers are theorizing infected trees brought from Wyoming and transplanted into our mountain subdivisions are introducing that white pine blister rust. Road access provides risk for human-caused fires on the ARP, but roads also allow rapid response opportunity for fire suppression activities. Even though it is acknowledged that road access in the Forest increases risk for human-caused fire, this risk can be minimized through administrative means such as smoking and campfire restrictions and complete closures during high and extreme fire danger periods.

EF(5): What are the adverse effects of noise caused by developing, using, and maintaining roads?

Wildlife Effects:

The adverse effects of noise on wildlife have been documented in several studies Noise can harm wildlife health by altering wildlife reproduction, survivorship, habitat use, distribution, abundance and genetic composition. Noise can also harass animals by disturbing them in ways that are threatening or uncomfortable, causing change in behavior. Noise can cause avoidance, stress, defensive or aggressive behaviors, distraction and susceptibility to predation, abandonment or neglect of young, panic induced losses, increased activity causing depletion of energy reserves, and masking of natural sounds important to survival in the wild (Bowles in: Knight and Gutzwiller 1995).

Human Effects:

Noise from developing, using and maintaining roads may affect people within hearing distance. There is no specific data on the effects of noise from ARP roads on people, however, anecdotal data suggests that noise effects people differently in different Recreation Opportunity Spectrum settings.

In the **Primitive and Semi-Primitive Non-Motorized** settings, people are categorized as having a direct aversion to the sounds of road construction, maintenance and use. People travel to these more remote areas for solitude and to remove themselves from the sight and sound of human activity. If they encounter noise from road-related activities (sound travels differently under different circumstances and the potential to hear road related activity is real) they are likely to be disappointed in their recreation experience.

In the **Semi-Primitive Motorized and Roaded Natural** settings, roads and motorized trails are used to access fairly remote areas of the natural environment and are also part of the recreation experience (riding motorcycles, all-terrain and four-wheel drive vehicles), and where sounds of some other users would be expected and accepted. Sounds of road construction or maintenance

would most likely not be expected or accepted, and the recreation experience would be diminished if they were encountered.

In the **Rural and Urban** settings, roads are used substantially to access play areas and are often part of the recreation experience (driving for pleasure) and where the sounds of other users would be expected and accepted. Sights and sounds of road construction or maintenance are a regular part of the driving experience and are expected and tolerated for the most part.

Aquatic, Riparian Zone, and Water Quality (AQ)

AQ(1): How and where does the road system modify the surface and subsurface hydrology of the area?

Roads have three main effects on water: 1) they **intercept** rainfall directly on the road surface and road cutbanks and subsurface water moving down the hillslope or springs; 2) they **concentrate** flow, either on the surface or in an adjacent ditch or channel; and 3) they **divert** or **reroute** water from normal flow paths had the roads not been built. Increasing road density increases the impact to a watershed and it's waterways. For example, by intercepting surface and subsurface flow, and concentrating and diverting it into culverts, ditches, gullies, and channels, road systems effectively increase the density of streams in the landscape, thereby changing the amount of time it takes for water to enter a stream channel, altering the **timing of peak flows** and hydrograph shape. Usually the change in the hydrograph's shape is a quicker runoff response time (i.e. "flashier" flow response), which produces a taller and sharper shape in the hydrograph's peak flow design.

AQ(2): How and where does the road system generate surface erosion?

Surface erosion is dependent on soils, road surfacing, road grade, age of the road, traffic volumes, maintenance practices, and the effectiveness and spacing of drainage features. Fine and course soils have the highest potential erosion rates from road surfaces. Very fine soils are easily displaced and rutted when wet. Course soils, with few fines have little cohesiveness and can be easily eroded. Typically, native surface roads experience greater erosion of the road surface than do graveled roads, paved roads have very little or no erosion from the road surface. Road grade is a key attribute in road erosion. Steeper grades allow water to carry greater amounts of detached soil for greater distance along and away from the road surface. Studies have found that sediment delivery to stream systems is greatest in the initial years after road construction, although raw ditchlines, unvegetated cut and fill slopes and frequently maintained roads can remain chronic sources of sediment.

The primary opportunities to reduce surface erosion from Forest roads include:

- Increasing the number and effectiveness of drainage structures.
- Improving the road surface by gravelling or adding a binding material to native surface roads with little or no natural binder.
- Restricting use of native surface roads during periods when roads are wet and susceptible to rutting and surface erosion.

AQ(3): How and where does the road system affect mass wasting?

Road related mass wasting results from 1) improper placement and construction of road fills and stream crossings, 2) inadequate culvert sizes to accommodate peak flows, sediment loads, and woody debris, 3) location of roads on slopes prone to mass wasting, and 4)water diversion onto unstable hillslopes.

Mass wasting is not a predominant erosional process on much of the Forest. Roads located on the Sulphur District west of the Fraser River and Colorado River valleys are the most likely to occur on lands where mass wasting is a significant concern. Mass wasting of road fill can also occur where culverts plug and direct stream flow into and across road fill, and where roads parallel stream channels and interfere with the streams natural tendency to meander across the floodplain.

Opportunities to address roads with mass wasting potential include:

- Relocating roads to more stable terrain
- Relocation of drainage structures so that outlets drain onto less sensitive areas with flatter slopes or well-drained soils.
- Collection and drainage of subsurface water away from the road prism.

AQ(4): How and where do road-stream crossings influence local stream channels and water quality?

Road-stream crossings have the potential to directly and indirectly affect local stream channels and water quality. Poorly designed crossings directly affect streams when they constrict the channel, are misaligned relative to the natural stream channel, or when they are improperly sized. Crossings also can serve to connect disturbed areas (e.g. the road surface, landings, parking areas) to the stream so that water and sediment are delivered directly to the stream channel. Opportunities to improve road-stream crossings include:

- Design crossings to pass all potential products including flow, sediment and woody debris
- Realign crossings that are not consistent with channel pattern
- Change the crossing to better fit the situation; for example, consider bridges or hardened fords on streams with floodplains, and consider bottomless arch culverts in place of round culverts.
- Add cross-drains near road-stream crossings to reduce connected disturbed areas.
- Reduce the number of road-stream crossings to minimize potential for adverse effects.

AQ(5): How and where does the road system create potential for pollutants, such as chemical spills, oils, de-icing salts, or herbicides, to enter surface waters?

The potential for pollutants to reach stream channels occurs wherever roads run adjacent to, or cross, streams. Roads located on steep hillsides are can also allow spills to be transported considerable distances along drainage ditches or across hillslopes to stream channels.

Historically, the road that has been the site of the largest number of spills that have affected Forest lands and water is US Highway 6 over Loveland pass. Trucks carrying hazardous chemicals are not allowed to use the Eisenhower Tunnel on I-70, and are rerouted onto Hwy 6. A pollutant spill occurs on the average every 2-3 years. Other state and federal highways crossing the Forest are also at risk of pollutant spills

Forest administered roads at greatest risk to pollutant spills are those roads on the Pawnee Grasslands that are used as transport routes to service gas and oil wells. The environmental consequences of spills on the Grasslands are mitigated by flat terrain that would help to limit the spread of any spill and by the paucity of surface water that could be polluted.

Fuel spills of lesser magnitude can also occur on other Forest roads where logging, road construction, and other forest management activities require that fuel be transported to the site. Risk of spills can be reduced by contract stipulations that specify fueling practices, haul speeds, and road and weather limitations.

Magnesium or calcium chloride is applied to many paved state and county roads as a de-icing agent and magnesium chloride is applied to unpaved roads for dust abatement. At least one Forest road, Road 125 to the Arapaho Bay campground near Lake Granby also receives magnesium chloride for dust abatement.

The application of magnesium or calcium chloride may affect water quality, but studies have found that the effects can only be detected after many years of repeated applications (Heffner 1997). When magnesium chloride is used for dust abatement, it is less likely to be transported by runoff to a stream channel than when it is used as a de-icer because it adheres to the road surface. Spills can occur during application into adjacent surface waters. This factor should be considered in areas where threatened, endangered or sensitive aquatic species are present.

Roads create the potential for the spread of noxious weeds. Control of noxious weeds along roads located near streams and water bodies presents a risk that herbicides may be introduced to surface water.

AQ(6): How and where is the road system "hydrologically connected" to the stream system? How do the connections affect water quality and quantity (such as, the delivery of sediments and chemicals, thermal increases, elevated peak flows)?

The road system is hydrologically connected to the stream system at road crossings, where road drainage is not provided or where drainage structures empty into ephemeral, intermittent or perennial streams, or where there is an insufficient buffer to filter sediment and allow water to infiltrate. These conditions essentially make the road system part of the channel network. As discussed in AQ1, roads can increase the amount and rate of water delivered to the stream. AQ2 and AQ4 discuss that roads can be part of the connected disturbed area that delivers sediment to streams. Roads are pathways that can lead to the introduction of chemical pollutants (see AQ5). Roads alter thermal energy to stream channels where they are constructed in riparian areas closely parallel to stream channels and take the place of shading

vegetation.

AQ(7): What downstream beneficial uses of water exist in the area? What changes in uses and demand are expected over time? How are they affected or put at risk by road-derived pollutants?

All watersheds in the Arapaho-Roosevelt National Forest provide water for municipal, agricultural, industrial, and residential water supply. Forest and Grassland streams and waterbodies also provide for recreation, aquatic life and wetlands.

Demand for water uses is increasing and will continue to increase as the population along the Front Range continues to grow. There is increasing competition between instream uses and diversion and water storage.

Roads provide access to water facilities located on Forest lands. They also provide access to people seeking non-consumptive uses such as fishing, boating, and swimming. As detailed in previous questions, roads also provide pathways for pollutant introduction, increases in sediment, and changes in flow regime. Because allow access into the woods, they can indirectly contribute to catastrophic events such as large chemical spills and wildfires.

AQ(8): How and where does the road system affect wetlands?

Roads affect wetlands directly by encroachment and indirectly by altering surface and subsurface flow patterns. Road encroachment leads to the direct loss of wetlands by occupying wetland areas. Alteration of flow paths can affect wetland function beyond the area directly affected by the road. The Watershed Conservation Practices Handbook (FSH 2509.25) provides measures to protect wetlands.
Opportunities to reduce the effects of roads on wetlands include the following:

- Relocate roads out of wetlands.
- Where relocation is not an option, use measures that restore wetland hydrology, such as raised prisms with diffuse drainage through the road fill.

AQ(9): How does the road system alter physical channel dynamics, including isolation of floodplains: constraints on channel migration; and the movement of large wood, fine organic matter, and sediment?

Roads affect geomorphic and channel dynamics from different mechanisms: 1) accelerating erosion from the road surface and prism itself by both mass and surface erosion processes that adds or changes the equilibrium dynamics in a channel through sediment loading and erosional processes; 2) directly affecting channel structure and geometry by constraints to the floodplain or stream that have a natural tendency for lateral migration; 3) altering of surface flow paths and increasing stream density, leading to increased landscape dissection or channelization onto previously unchannelized portions of the landscape; 4) causing channels to be straighted, which can increase stream power and lead to channel downcutting and the abandonment of floodplains and riparian areas; and 5) causing complex interactions among water, sediment, and woody

materials where an increase in sediment movements, road side failures, slumpings, stream bank failures, landslides, and changes in streamflow dynamics will occur. These mechanisms involve different physical processes, have varying effects on erosion rates, and are not uniformly distributed either within or among landscapes or watersheds.

AQ(10): How and where does the road system restrict the migration and movement of aquatic organisms? What aquatic species are affected and to what extent?

Road culverts primarily affect migration and movement of aquatic organisms as the road crosses streams. Generally, there can be restrictions on upstream migration, although downstream migration can be affected. The restriction results from hanging culverts, high flow velocities in culverts, inadequate depth for fish and deposition as a result of culvert placement. In very few locations, barriers may be desirable to protect native species. Culverts can affect the migration of amphibian the greatest concern is the effect on fish species.

Brook trout are the most widely distributed fish species on the Arapaho and Roosevelt National Forests. Other non-native species include rainbow and brown trout. The native species of concern are Colorado cutthroat trout on the west of the Continental Divide and the Endangered Species Act threatened greenback cutthroat trout in the Platte River drainage. There are no known migration barriers for greenback known on the two forests. There are two known barriers to Colorado cutthroat trout migration on the Moffatt road (FDR 149). These culverts are currently planned for replacement.

AQ(11): How does the road system affect shading, litterfall, and riparian plant communities?

Road systems located in riparian directly affect shading, litterfall and riparian plant communities by occupying the space that would otherwise be occupied by riparian vegetation. Roads can also affect riparian communities by intercepting surface and subsurface flows and concentrating these flows through drainage features such as culverts and dips. Roads can cause artificial straightening and down-cutting, making it less likely that riparian vegetation would be maintained along the stream banks. Riparian communities play a vital role in providing shade and energy to stream systems. Removal or degradation of these communities can affect stream stability and water temperatures, which in turn affects aquatic habitat. The Watershed Conservation Practices Handbook (FSH 2409.25) provides measures to protect riparian areas.

AQ(12): How and where does the road system contribute to fishing, poaching, or direct habitat loss for at-risk aquatic species?

High traffic roads adjacent to streams with fish are the most likely to contribute to fishing and poaching. This is not generally considered an issue on the Arapaho and Roosevelt National Forests and does not measurably affect aquatic populations and at-risk aquatic species.

The road system contributes to direct habitat loss where mass movements associated with roads directly impact stream channels (AQ3), where sediment is delivered directly to the stream channel through connected disturbed areas (AQ6), at road-steam intersections (AQ9), and where the road system is restricting channel migration and isolating floodplains (AQ9). Areas of particular concern are watersheds with greenback and Colorado cutthroat trout populations, especially those identified as high-risk. Opportunities to address problems areas would be similar to those previously identified.

AQ(13): How and where does the road facilitate the introduction of non-native aquatic species?

The introduction of non-native species occurs primarily through the stocking of non-native fish. The Colorado Department of Wildlife generally coordinates stocking to ensure that non-native aquatic species are not being introduced into waters containing native fish species. Stocking of non-native fish occurs throughout the ARP.

AQ(14): To what extent does the road system overlap with areas of exceptionally high aquatic diversity or productivity, or areas containing rare or unique aquatic species or species of interest?

The road system generally has moderate overlap with areas of exceptionally high aquatic diversity or aquatic species of interest. The primary species of interest are Colorado River cutthroat trout, greenback cutthroat trout, boreal toads, tiger salamander, wood frog, and the plains topminnow. Watersheds containing sensitive fish and amphibian species were identified and considered. Those that have a high risk of resource damage associated with roads and contain sensitive aquatic populations would be a priority for more detailed watershed analysis.

Terrestrial Wildlife (TW)

TW(1): What are the direct affects of the road system on terrestrial species habitat?

Direct effects to terrestrial species habitat from the ARP road system include: 1) loss of habitat due to conversion of native vegetation to a road surface (paved, gravel, dirt); 2) fragmentation of habitats due to road system development; 3) interruption in wildlife movements to breeding areas, winter- summer-ranges, or other used habitats; and 4) avoidance of habitat use by wildlife due to human disturbance caused by use of the road system.

TW(2): How does the road system facilitate human activities that affect habitat?

Numerous species are disturbed by human activities at least during certain times of the year and as a result cannot effectively utilize otherwise available habitat (Knight and Gutzwiller 1995). Effective habitat for wildlife is considered to be mostly undisturbed habitat that is buffered from regularly used roads and trails, both motorized and nonmotorized.

Habitat effects from human activities are facilitated by road systems through yearlong or seasonal: 1) motorized and non-motorized travel modes along roads; 2) access for developed

and dispersed recreation use; 3) access for commodity production (e.g. livestock, timber and mining): and 4) extension of different travel modes beyond roads onto trails, and cross country where travel ways do not exist.

Concentrated human uses such as dispersed shooting areas, camping or large group events also impact wildlife habitat to varying degrees. Some large group events occur periodically and often for a short period of time. The effects of such an activity are likely to last only a short period of time, a few days or a week. In contrast other use site such as certain dispersed shooting areas receive high-use sustained over a long period of time. At these sites, effects to wildlife habitat are 1) displacement of wildlife due to noise associated with human presence and discharge of firearms; and 2) loss of habitat from target shooting. Loss of vegetation and soil, fundamentals of habitat, are also often evident from off-road activities associated with target shooting (e.g. placement of targets, shooters choosing separate shooting sites in each vicinity and associated '4-wheeling').

Past commodity production has afforded the building of many of the roads that exist today. Associated activities such as timber harvest and livestock management influence wildlife in various ways, including changes to wildlife forage, cover, reproduction areas and movement.

TW(3): How does the road system affect legal and illegal human activities (including trapping, hunting, poaching, harassment, road kill, or illegal kill levels)? What are the affects on wildlife species?

The existing road system being analyzed in this document influences both legal and illegal human activities. Legal activities such as hunting and trapping are facilitated by the existing road system. The road system facilitates hunting and trapping by making access to areas easier and faster, and also helps distribute road hunters (sportsmen who hunt from their vehicles or along road ways) over a greater area. In contrast, the same benefits of roads for legal activities such as hunting and trapping also help facilitate some illegal activities such as poaching. Poachers benefit and find it easy to search large areas relatively fast and take wildlife over wide networks of roads.

Too many roads (high road densities) can also affect wildlife negatively through harassment, displacement, or vulnerability to hunters and poachers. The Rocky Mountain Elk Foundation has funded several studies on the effects of road on elk, and in particular to effects on mature bulls (## find from Lincoln appendix B Stalling 1994). These studies have found that hunter densities increase in proportion to road densities. The more roads you have in an area, the more hunters you will have, resulting in more hunting pressure and harvesting of mature bulls. Stalling (1994) summarized one study that looked at elk mortality in three different areas; 1) High density of open roads, 2) Roads closed to motorized vehicles during hunting season, and 3) area with no roads. In the area with a high density of open roads, only 5% of all bulls lived to maturity (4.5 years). None of the bulls lived past 5.5 years, and the herd contained about 10 bulls for every 100 cows. In the area with roads closed during the hunting season, 16% of the bulls lived past maturity, most reaching 7.5 years. The herd contained 20 bulls for every 100 cows. In the area with no roads, 30% of the bulls lived to maturity, most reaching 10 years.

This herd contained 35 bulls per 100 cows. The study found that as road access increases, elk become increasingly vulnerable to hunting mortality. This trend will result in elk populations with undesirable sex and age structure, increasingly complex and restrictive hunting regulations to protect elk herds, and a loss of recreational opportunity.

Illegal motorized vehicle use off road is a problem linked to road systems. New roads/trails are constantly being created on the Forests and Grassland by illegal use of off-road vehicles.

TW(4): How does the road system directly affect unique communities or special features in the area?

Unique communities or special features for wildlife are influenced by the road system in the same way species and habitat are affected, as described above. Included are talus slopes, caves, springs, seeps, wetlands, aquatic habitats, riparian areas, short grass prairies, old growth forests, alpine tundra and other productive wildlife habitats.

The ARP has modeled and estimated the amount and location of mostly undisturbed (effective) and mostly disturbed (ineffective) habitat for wildlife. Roads that are open to public use, receive either motorized or non-motorized use, and receive moderate- to high-use (11 or more people or vehicles/week) are estimated to reduce effective habitat within certain distances of the travel way depending on terrain and vegetation conditions. Effective habitat was estimated to exist on about 67 percent of the Forests and 60 percent of the Grassland. Accordingly, those unique communities and special features for wildlife that are near open, regularly used roads have reduced effective habitat due to human use along roads.

Economics (EC)

EC(1): What are the monetary costs associated with the current road system? How do these costs compare to the budgets for management and maintenance of the road system?

Agency costs for roads include development, operation, maintenance and liability. Agency revenue that is associated with vehicular access include harvest of wood products, mining, grazing, recreation and special uses.

Reducing road miles under jurisdiction of the agency or by reducing maintenance level of the roads will reduce operation, maintenance and risk costs. Liability costs are reduced by proper operation and maintenance of the roads.

Revenue to the agency may be improved by improved access, but the cost to develop the improved access may far exceed the revenue, depending upon market conditions for the resource being used. In the recent past, prices for timber have not supported improvement of roads for access.

Actual agency costs and benefits is best estimated at a project or watershed level of analysis, where specific and detailed information can be developed that reflects current market

conditions.

EC(2): What are the indirect economic contributions of roads including market and non market costs and benefits associated with road system design, management, and operations? #this is the new question

Analysis of these benefits (both direct and indirect) and costs is best approached during project or watershed analysis, where site-specific information will be developed.

EC(3): What are the direct economic impacts of the current road system and its management upon communities around the Forests and Grassland? #this is the new question

Better vehicular access can generally be equated with an increased opportunity for economic activity. In general, improved access will provide more people more opportunities to use the resources of the National Forest. Analysis of the benefits and costs is best approached during project or watershed analysis, where site-specific information will be developed.

Timber Management (TM)

TM(1): How does road spacing and location affect logging system feasibility?

Most harvest activities whether it's conducted in the commercial forestland (mixed conifer, ponderosa pine, aspen) are harvested with ground-based equipment. The trees are either felled by hand with chain saws or cut mechanically with a feller-buncher and then moved to the landing with rubber or tracked skidders. In general, a road spacing of 2,000 to 3,000 feet would be economical for ground-based skidding. Cable logging has not been utilized for decades on the Arapaho and Roosevelt National Forest. In general, the use of cable logging requires more closer road system spacing than with ground-based systems.

In general, close road spacing results in quick turn times and higher production that reduces log-moving costs and increases log value. Although closer road spacing can increase the total road cost due to more roads, this total cost can be reduced with the use of temporary roads.

Generally, road construction is only allowed where it is determined to be economically and technically necessary to achieve resource management objectives. The most efficient road spacing that would maximize log values is not acceptable because it usually conflicts with other resource management objectives.

TM(2): How does the road system affect managing the suitable timber base and other lands? TM(3): How does the road system affect access to timber stands needing silvicultural treatment?

When the Forest Plan was signed in 1997, 188,907 acres were identified as lands suitable for timber production from the tentatively suitable land base of 294,068 acres. The Forest Plan identified several roadless areas and in some cases, identified lands in those areas as suited and

available. Recent court decisions may make those lands unsuitable and withdrawn if no new roads can be built in these areas. Suitable and tentatively suitable lands were comprised of Spruce-fir, Lodgepole, Douglas-fir, Ponderosa Pine species capable of growing 20 cubic feet per acre per year. The Allowable Sale Quantity was calculated from growth and yield projections based on these areas only.

Other lands identified as tentatively suitable and not scheduled or unsuitable for timber production may have harvest or other vegetative treatments prescribed. This may occur if the treatments will benefit other resources. For example, prescribed burning for forest health may occur on both suited and unsuited lands. Roads can make these treatments safer and easier to implement.

The Arapaho and Roosevelt National Forests have an active program of planned precommercial treatment (harvesting trees less than 7 inches DBH) for the purpose of reducing fire hazard. These thinning treatments, mainly within the Wildland-Urban Interface (private homes withing or adjacent to National Forest lands), will produce material (biomass) that needs to be removed and utilized if possible. This activity may require construction of new access and use and maintenance of existing roads.

Minerals Management (MM)

MM(1): How does the road system affect access to locatable, leasable, and salable minerals?

The maintenance level 3, 4 and 5 roads in this analysis provide adequate access to existing oil and gas wells, production facilities, tank batteries and related infrastructure. They also provide adequate access to existing saleable mineral operations. Access to proposed new developments is handled during project specific planning and can include recommendations for the development of both maintenance level 2 and maintenance level 3, 4, and 5 roads.

Mineral resources are separated into three categories that include locatables, leasables and saleables.

> **Locatable Minerals** are those deposits subject to location and development under the General Mining Law of 1872 (as amended). The Forest Service does not manage the mineral resources on National Forest System lands. That authority rests with the Secretary of the Interior. Forest Service authority is directed at the use of the surface of National Forest System lands in connection to the operations authorized under the United States Mining laws (30 U.S.C. 21-54) which confer a statutory right to enter upon the public lands to search for minerals. Forest Service regulations at 36 C.F.R. 228, Subpart A, provide that operations shall minimized adverse environmental impacts to surface resources, which includes the following:
>
> - Using all practicable measures to maintain and protect wildlife habitat affected by an operation

- Reclaiming surface disturbances, where practicable

Leasable Minerals are federally owned fossil fuels (oil, gas, coal, oil shale, etc.), geothermal resources, sulfur, phosphates and uranium. These minerals are subject to exploration and development under leases, permits or licenses issued by the Secretary of the Interior, with Forest Service consent.

Saleable Minerals include mineral materials, otherwise known as "common varieties", which generally include deposits of sand, gravel, clay, rock or stone used for a number of purposes including road surfacing, construction materials, and landscaping. The disposal of these materials is by a mineral materials contract issued at the discretion of the Forest Service.

Range Management (RM)

RM(1): How does the road system affect access to range allotments?

The road system is vital for efficient administration and management of permitted grazing allotments. Forest Service personnel must be able to monitor, inspect and evaluate range conditions on a regular basis to effectively administer existing grazing permits. The current road system allows for rapid access to all of the allotments on the ARP.

Grazing permittees need reasonable vehicular access within allotments to maintain existing range improvements and to manage and care for permitted livestock. Care for livestock may include transporting large trailers or truckloads of cattle or pickups with horse trailers on Forest or Grassland roads.

Water Production (WP)

WP(1): How does the road system affect access, constructing, maintaining, monitoring, and operating water diversions, impoundments, and distribution canals or pipes?

There are many water diversions, reservoirs, wells, spring developments, pipelines, canals, and other water development infrastructure located on Forest lands. Roads provide primary access to all but a few of the facilities, located in wilderness areas. For the vast majority of the facilities, operation would be difficult or impossible without road access.

WP(2): How does road development and use affect water quality in municipal watersheds?

There are no officially designated municipal watersheds, but the entire Forest furnishes water that is used for municipal supply. Roads affect surface and sub-surface hydrology, erosion and sediment, and risk of water supply contamination. Potential affects of individual roads depend on location of the road in the watershed, drainage, surfacing, and use. Please see answers to questions AQ1 through AQ7 for additional detail.

WP(3) How does the road system affect access to hydroelectric power generation?

There is limited hydropower development on the Forest. Roads under other jurisdictions (e.g. private, county, state, federal) provide access to the hydropower facilities. While Forest roads can be used to access some of the facilities, they are not the primary means of access.

Special Forest Products (SP)

SP(1): How does the road system affect access for collecting special forest products?

The current maintenance level 3, 4 and 5 road system provides adequate access for collecting special forest products such as mushrooms, seed cones, transplants, Christmas trees, firewood, etc.. If road closures or seasonal closures are considered in a project or watershed analysis, access for special forest products will be considered.

Special-Use Permits (SU)

SU(1): How does the road system affect managing special-use permit sites (concessionaires, communications sites, utility corridors, and so on)?

The maintenance level 3, 4 and 5 roads in this analysis serve as general access to "areas" that lead to maintenance level 2 roads that are adequate for management and administration of special use permits.

General Public Transportation (GT)

GT(1): How does the road system connect to public roads and provide primary access to communities?

Primary access to communities in and adjacent to the ARP is provided by local, county, state and interstate transportation systems. There are no incorporated or unincorporated communities, which depend on National Forest System Roads for their primary (or secondary) access. However, there are several permitted commercial uses, private land developments and individual private land inholdings that depend on access by National Forest roads. In most cases, the access is not via level 3, 4, or 5 roads. In cases where private land road access (including rural subdivisions) is necessary on National Forest roads, efforts are made to issue easements to either the private individuals or homeowner associations. If access is by a road that is generally used by the public for other access, no easement is required. Maintenance and management of roads to permitted commercial uses that are not commonly used by the public for purposes other than access to the permitted use are included in the permits.

The ARP should continue to use permitting and easement tools to require commercial and private users to provide road maintenance commensurate with their use. Whenever possible, other agencies should be encouraged to assume jurisdiction on major roads providing access to private lands.

Additionally, though the ARP roads themselves are not the main thoroughfares to these communities, some of these routes do connect to communities and make for pleasurable drives, loop drives, and can act as alternate routes when the main route is out of service. One of the enjoyable activities people like to participate in is driving through the Forests and Grassland, especially when it creates a loop opportunity and / or begins and ends at community destinations.

These roads and others are important to and used by smaller communities around the Forest. Many people in these communities rely on access to the Forest for their livelihood as well as for recreation. The Forest is important for recreation, timber, ranching, and mining.

As the Front Range population increases, recreation and commercial use of the road system is also expected to increase.

GT(2): How does the road system connect large blocks of land in other ownership to public roads (ad hoc communities, subdivisions, inholdings and so on)?

The forest road system does not connect large blocks of land in other ownerships to the public road system. The county and state road systems serve ad-hoc communities, subdivisions and most inholdings. See answer to GS-1.

GT(3): How does the road system affect managing roads with shared ownership or with limited jurisdiction? (RS 2477, cost-share, prescriptive rights, FLPMA easements, FRTA easements, DOT easements

The ARP transportation atlas shows several Forest roads with shared jurisdiction with counties. In most cases, this is not shared ownership. The classification is a holdover from older inventories and has not been corrected. In many cases, however, arterial and collector roads are shown as "County" jurisdiction because they are "claimed" as "County" roads by the local counties, but the necessary legal documents and easements either do not exist, or are not fully documented. Formal easements to counties do not exist on many of these roads. Political concerns with some counties do not make it cost-effective or a high priority to pursue actions or require the counties to provide the necessary proof for establishment of jurisdiction. Many of these roads are roads that were established during major mineral activities in the Colorado Mineral belt in the mid to late 1800's. It will have to be determined if these level 3, 4, and 5 roads have legitimate RS 2477 status.

If counties could exercise and the Forest Service could recognize reasonable RS 2477 claims, many National Forest System and private property access issues could be resolved. During mineral activities in the past, road systems were established that accessed part or all of most of the mineral patents. Both large and small parcels of National Forest lands lie between and beyond the patented land parcels. Many of the mineral patents have been purchased for home sites. Some of the property owners are not willing to allow Forest Service access or access to private parcels beyond their own. These same owners also request easements across National Forest lands to their property. In these cases, the ARP has been able to execute reciprocal

rights of way, but many times the right is limited to Forest Service administrative traffic and does not include commercial activities, public access or access for other private landowners. If these old road systems were to be legitimate RS 2477 roads and if counties were successful in claiming that right, there would be legal pubic access to not only the National Forest parcels, but also other private property owners. Most of these roads are maintenance level 2 roads and are not subject to analysis in this roads analysis. Some have the potential of becoming higher standard roads.

In Weld County (Pawnee National Grassland), the county has claimed road locations on all of the section lines. This creates another set of jurisdictional issues when the roads (and non-roads) cross national grassland lands.

The ARP has issued appropriate (FRTA and FLPMA) easements to inholdings where necessary, but is behind in issuing Department of Transportation (DOT) easements to the state and counties on the arterial and collector roads that cross NFS. DOT easements have been issued on the major state and one interstate highway that cross National Forest lands. Some of the secondary state highways do not have DOT easements. DOT easements on these highways are being issued when opportunities arise, usually when major reconstruction is proposed.

Virtually, all of the Forest roads feed into arterial and collector road systems which are managed by a public road agency such as the State and counties. Management of the ARP road system is made easier as access via public road systems is generally good. .

The ARP should make an effort to issue formal easements to the counties for all roads which are legitimate county roads and for which there is mutual agreement that the roads are necessary for public travel and are of mutual benefit, irrespective of potential RS 2477 claims. In a similar manner, the ARP should issue easements to the state for all public highways on the State systems that do not have easements.

When national policy allows, the ARP should work with counties to resolve RS 2477 claims on roads across NFS lands.

GT(4): How does the road system address the safety of road users?

With increased use by more urbanized visitors, expectations have changed. Forest users expect to be safe, to have ready access to emergency medical services and evacuation routes.

In 1975, the Forest Service developed a Memorandum of Understanding with the Federal Highway Administration that required the Forest Service to apply the requirements of the National Highway safety program, established by the Highway Safety Act, to all roads open to public travel. In 1982, this agreement was modified to define “open to public travel” as “those roads passable by four-wheeled standard passenger cars and open to general public use without restrictive gates, prohibitive signs…” Most roads maintained at level 3, 4, and 5 meet this definition. Design, maintenance, and traffic control on these roads emphasizes user safety and economic efficiency.

The largest proportion of road maintenance and improvement funds allocated to the Forest is spent on these higher standard roads. Safety work such as surface maintenance, roadside clearing and installation and maintenance of warning and regulatory signs are performed on an annual basis.

Funding for road maintenance is not adequate to address maintenance needs on all roads. Road condition surveys conducted in 1999 to 2003 reveal a total maintenance backlog of $4 million for maintenance level 3, 4, 5 and $9 million for maintenance level 1-5. The condition surveys document a need of approximately $1.7 million annually to maintain all roads (ML 1-5) in the ARP system. The annual funding for roads on the ARP ranges from about $1 to $1.3 million. But this annual funding must cover not only road maintenance but, travel management, rights-of-way acquisitions, minor road construction and reconstruction, and overhead costs.

Administrative Use (AU)

AU(1): How does the road system affect access needed for research, inventory, and monitoring?

On the ARP, the road system appears to provide adequate access for research, inventory, and monitoring.

AU(2): How does the road system affect investigative or enforcement activities?

The level 3, 4, and 5 road system on the ARP generally provides good access for investigative and enforcement activities. These roads provide access to developed and dispersed recreation sites where many common violations occur. These roads also provide access to the many developed trailhead-parking areas for the trail system that provides backcountry access. While the road system provides access to perform investigative and enforcement activities, it also provides access for increasing public use of the National Forest System lands, hence, the Forests and Grassland are experiencing an increase of criminal activities.

Protection (PT)

PT(1): How does the road system affect fuels management?

The maintenance level 3, 4 and 5 roads in this analysis provide adequate access to the general areas where fuels management activities occur. Most fuels management project activities need only maintenance level 2 (four-wheel drive) access. To access areas for efficient fuels management, sometimes closed roads are opened or short temporary roads are constructed. Many of the most critical fuels management project areas are in the Wildland-Urban Interface (WUI), and access to them is gained through the bordering private lands. Increasingly, private landowners are installing locked gates on National Forest roads that pass through private lands. The Forest Service does not have legal rights of way on these roads. The time taken to gain legal rights of way to pass through these gates is slowing the fuels management effort. Road use agreements with private lands owners are negotiated in some cases.

PT(2): How does the road system affect the capacity of the Forest Service and cooperators to suppress wildfires?

The maintenance level 3, 4 and 5 roads in this analysis provide adequate access to respond to wildfires. Roads not maintained to level 3 standards are often found in poor road locations or in areas with little travel. Because of this their travel distances are further and travel time often longer. Larger fire trucks and other fire fighting equipment may not be able to travel these roads and so effective tools may not be used. Increasingly, private landowners are installing locked gates on National Forest roads that pass through private lands. The Forest Service does not have legal rights of way on these roads. The time taken to pass through these gates is slowing the Forest Service response time to suppress wildfires.

PT(3): How does the road system affect risk to firefighters and to public safety?

The slower the response is to a fire; the risk increases both to firefighters and to public safety. The longer it takes to respond to a fire, the larger and more difficult the wildfire is to suppress. Other factors such as vegetation flammability, topography and weather being equal, a poor road system causes slower response times and larger fires than areas served by better road systems.

PT(4): How does the road system contribute to airborne dust emissions resulting in reduced visibility and human health concerns?

Unpaved native soil or graveled roads contribute airborne dust during times of dry weather conditions, especially during extended drought periods. Dust emissions increase with increased traffic and vehicle weight. Winds pick up and transport fine dust from unpaved roads and release them downwind. Visibility may be reduced along unpaved roads, especially during windy periods. Airborne dust can be a nuisance in areas such as high use recreation sites, road adjacent campgrounds, and nearby residences. In some localized areas, dust can become a health concern for sensitive individuals.

Some Forest roads provide primary access to private land. With increasing residential development on these lands, traffic may increase significantly on Forest roads, increasing the dust emissions. Dust emissions can be reduced with dust abatement, or paving unpaved roads.

Unroaded Recreation (RR)

UR(1): I s there now or will there be in the future excess supply or excess demand for unroaded recreation opportunities?

There are no plans to construct roads in the inventoried roadless areas (areas larger than 5000 acres). On the ARP, the supply of large unroaded recreation opportunities exist in the Management Area prescriptions of 1.5 – Wild Rivers, 1.42 – Core Habitats-Restoration, 1.41 – Core Habitats-Existing, 1.3 – Backcountry Recreation, 1.2 – Recommended for Wilderness, and 1.1 – Wilderness Areas. As world, National and local human populations increase, demand for all types of recreation, including unroaded, is expected to increase. Recent designation of the James Peak Wilderness Area and proposals for additional Wilderness designation in Colorado and for the Troublesome area in particular, point to potential increases in supply for

unroaded recreation opportunities in the near future.

UR(2): Is developing new roads into unroaded areas, decommissioning of existing roads, or changing the maintenance of existing roads causing substantial changes in the quantity, quality, or type of unroaded recreation opportunities?

None of these activities are causing any substantial changes to unroaded recreation opportunities.

UR(3): What are the adverse effects of noise and other disturbances caused by developing, using, and maintaining roads, on the quantity, quality, and type of unroaded recreation opportunities?

Noise from developing, using and maintaining roads may affect people within hearing distance. There is no specific data on the effects of noise from ARP roads on people; however, anecdotal data suggests that noise effects people differently in different ROS settings. In the **Primitive and Semi-Primitive Non-Motorized** settings, one would expect a direct aversion to the sounds of road construction, maintenance and use. People travel to these more remote areas for solitude and to remove themselves from the sight and sound of human activity. If they encounter noise from road-related activities (sound travels differently under different circumstances and the potential to hear road related activity is real) they are likely to be disappointed in their recreation experience.

Noise and other disturbances have no effect on the quantity of unroaded recreation opportunities.

UR(4): Who participates in unroaded recreation in the areas affected by constructing, maintaining, and decommissioning roads?

Forest and Grassland users (such as hikers, hunters, equestrians, campers, anglers, mountain bikers, backcountry skiers, etc.) travel the arterial/collector roads (maintenance levels 3-5) to access areas of the ARP that are unroaded and provide the unroaded recreation experience they seek.

UR(5): What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?

Most Forest and Grassland users have a strong sense of place attachment to different locations on the ARP, and could possibly dispute any attempts to change existing access conditions or work with the ARP to develop alternate access. Wilderness users are also attached to the existing roads that take them to the trailheads that access their favorite Wilderness location. While alternative opportunities and locations are usually in the array of alternatives for most recreationists (i.e. their favorite location is occupied) they desire to exercise these options on a temporary basis rather than as a permanent adjustment to a closeure of a road or an area.

UR(6): How is developing new roads into unroaded areas affecting the Visual Quality Objective, VQO(s)?

There are no known proposals for new roads into unroaded areas, therefore, there would be no effect on the VQOs of unroaded areas.

Road-Related Recreation (RR)

RR(1): Is there nor or will there be in the future excess supply or excess demand for roaded recreation opportunities?

No excess supply exists and current trends are to remove some roads from the ARP road system. In addition, designation of new Wilderness Areas also has the effect of removing some roads from the road base layer. Demand for all types of recreation opportunities, including road-related ones, will continue to increase into the future due to an increasing Front Range population.

RR(2): Is developing new roads into unroaded areas, decommissioning of existing roads, or changing maintenance of existing roads causing substantial changes in the quantity, quality, or type of roaded recreation opportunities?

None of these are causing substantial changes in the quantity of road miles on the ARP. However, lack of road maintenance funds has a historical and ongoing effect of decreasing the road base quality of many of the roads on the ARP. Consequently, some road-related recreation opportunities have most likely diminished in quality, especially driving for pleasure activities on forest and grassland roads.

RR(3): What are the adverse effects of noise and other disturbances caused by constructing, using, and maintaining roads on the quantity, quality, or type of roaded recreation opportunities?

Noise from developing, using and maintaining roads may affect people within hearing distance.

There is no specific data on the effects of noise from ARP roads on people, however, anecdotal data suggests that noise effects people differently in different ROS settings. In the **Semi-Primitive Motorized and Roaded Natural** settings, roads and motorized trails are used to access fairly remote areas of the natural environment and are also part of the recreation experience (riding motorcycles, ATV's & 4x4's), and where sounds of some other users would be expected and accepted. Sounds of road construction or maintenance would most likely not be expected or accepted, and the recreation experience would be diminished if they were encountered. In the **Rural and Urban** settings, roads are used substantially to access play areas and are often part of the recreation experience (driving for pleasure) and where the sounds of other users would be expected and accepted. Sights and sounds of road construction or maintenance are a regular part of the driving experience and are expected and tolerated for the most part.

Noise and other disturbances have no effect on the quantity of unroaded recreation opportunities.

RR(4): Who participates in roaded recreation in the areas affected by road construction, changes in road maintenance, or road decommissioning?

A wide variety of forest/grassland users (such as hikers, wildlife watchers, hunters, equestrians, campers, anglers, mountain bikers, special forest product collectors, backcountry skiers, etc.) travel the arterial/collector roads (maintenance level 3-5 maintenance levels) to access areas that are unroaded, less densely roaded, or are trailhead departure points for their activities. In addition, motorcycle riders, all-terrain vehicle riders, four-wheel drive riders and people driving for pleasure in standard two-wheel drive vehicles use the arterial/collector roads for their activities, where allowed.

RR(5): What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?

Most ARP users have a strong sense of place attachment to different locations on the forest unit, and would fight any attempts to change existing access conditions. Wilderness users are also attached to the existing roads that take them to the trailheads that access their favorite Wilderness location. While alternative opportunities and locations are usually in the array of alternatives for most recreationists (i.e., their favorite location is occupied) these options are preferred to be exercised on a temporary basis rather than as a permanent adjustment to a closed road or area..

RR(6): How does the road system affect the Visual Quality Objective, VQO(s)?

Many arterial/collector roads (maintenance levels 3-5) traverse through a variety of VQO designations, although on the ARP, a large proportion of these roads are in Partial Retention VQO. Analysis of the effect of these roads on VQO's is best developed at a project or watershed level roads analysis, where site-specific information could be developed.

RR(7): How does road management affect wilderness attributes, including natural integrity, natural appearance, opportunities for solitude, and opportunities for primitive recreation?

Road management can greatly influence wilderness attributes. The ease of access into an area is a major factor in determining the amount of use the area may receive. This does not necessarily mean that a high maintenance level road running near wilderness will overload the wilderness with users. It may not be a problem if there are no egress points or parking areas along the route. Each analysis needs to determine what the access change will be for the proposed actions.

New road cuts and road prisms visible from within wilderness areas may also affect the opportunities for a primitive recreation experience although several miles away from the actual wilderness boundary. Roads that parallel, cherry stem or are near wilderness boundaries, can affect a wilderness

experience due to noise and visibility of the motorized activity. These roads tend to lead to places where motorized or mechanized violations into wilderness areas occur. While policy is not to create buffers around wilderness areas, opportunities may be analyzed to reduce the impacts within the view sheds from the wilderness areas.

Social Issues (SI)

SI(1): Who are the direct users of the road system and of the surrounding areas? What activities are they directly participating in on the forest? Where are these activities taking place?

The analysis of the maintenance level 3, 4, and 5 roads include almost all users of the national forests and grasslands. Many different people use the Forest Service road system, including residents of surrounding communities, visitors and tourists to national forests and grasslands, and groups of people (ethnic groups, subcultures, etc.) who may hold cultural, spiritual, sacred, traditional, or religious values associated with national forest system lands.

Understanding the types of uses and activities (the what) occurring on forest, commercial and non-commercial, legal and illegal, will assist in understanding why people come to the forest, the conflicts that arise, the values people hold for the forest, and attachments people form to places they visit. Ensuring users are identified and considered assists in developing an inclusive RAP process.

Many activities can take place throughout the ARP. Many types of management areas or recreation opportunity (ROS) settings provide opportunities for driving for pleasure, hunting, fishing, wildlife viewing, or nature study. Other activities require more specific settings or infrastructure such as developed camping, rock climbing, hiking, Wilderness hiking, or boating. The more limited or rare an opportunity the more likely users will be interested in protecting their access to the area.

SI(2): Why do people value their specific access to national forest and grasslands—what opportunities does access provide?

People's needs and values for roads are very diverse. Some people become very attached to the road access that is available, and tend to desire the status quo. Some people prefer that roads be available, but be in a condition that makes driving them a challenge. Some people would like to reduce the amount of roads, and, therefore, vehicles and other people in the Forests and Grassland. Some people want certain roads improved. Most people's needs or values fall somewhere in the middle, valuing a mix of motorized and non-motorized access. Many people hold deep and strong feelings about roads and road management. Change in road management is often upsetting to some people if it necessitates a change in their previous behavior.

Some people perceive roads to be the only means of access to forest resources, on which they may be economically and culturally dependent. Other people perceive roads to be a deterrent to healthy wildlife habitat, or unacceptable contributors to stream sedimentation. Sometimes they

value the fact that roads do not exist, as in wilderness areas, and believe these areas are critical to their individual, community, or ecosystem health. Certain types of recreation may be road-dependent, so users want roads maintained. Roads and road use may negatively affect other types of non-roaded recreation, and people thus express interest in wanting roads closed or decommissioned. Some of the values people hold for an area or a forest resource are spiritual, religious, or have ties to traditional customs.

Changes to the road system can affect people's values and experiences in many ways. Road obliteration, closure, reconstruction, or construction, or a change in management of an existing road in proximity to unique or special areas can change not only the access, but also the experience in terms of natural integrity, opportunities for solitude, vistas, noise and dust levels, and crowding in adjacent forestlands and grasslands. Understanding why people value and desire providing access, or limiting access to an area will help decision makers understand how changes in road management may impact peoples' current uses and future of the forest.

SI(3): What are the broader social and economic benefits and costs of the current forest/grassland road system and its management?

Many communities and individuals have social and economic dependencies on forest roads and the resources provided by access to them. Changes to a road system or in road management may affect (positively or negatively) local commuting patterns, lifestyles, forest resource-related businesses, the collection of special forest products; school bus routes; firefighting access needs in the wildland-urban interface; and access to municipal water supplies, power lines, and other local infrastructure.

The benefits provided to communities around the ARP extend beyond those who directly access or use forest and grassland resources. For example, people owning or working in businesses in 'gateway' communities often benefit from tourism associated with people visiting their national forest. Local businesses also benefit through resource activities including timber harvest, grazing, road development and maintenance, water projects, and other special uses in terms of potential economic activity.

Communities may benefit with infrastructure development that enhances their local quality of life, but at the same time, may be negatively impacted by road-use of the surrounding resources. These may include impacts to these communities's domestic water supplies or threat of human caused wildfires that could endanger their lives and homes.

Others from ethic groups, subcultures, tribes, national interest groups, as well as local residents of the area can hold cultural, spiritual, sacred, traditional, symbolic, or religious values associated with access to specific places, opportunities or resources on the national forest. These passive use, or indirect use values need to be identified and considered along with more use-direct values.

These values nationally and locally need to be considered over time in terms of incremental changes that have occurred. As roads are constructed or closed mile by mile in individual

projects, the impact does not seem great at such a small scale, but considering the roading or closures that have occurred in an area over time, and the change is sometimes significant. It is important to be aware of these larger changes and understand that often Forest Service projects are a balance between local, regional, and national values.

SI (4): How does the road system and road management contribute to or affect people's sense of place?

"Sense of place" describes the character of a physical location and the meaning, value, and feelings that people attach to it because of their experiences there. It integrates interpretations of a geographic place, including the biophysical setting, psychological influences (memory, choice, perception, imagination, emotion), and social and cultural influences. Changes in road management can affect access to these special places, or change their biophysical setting, affecting what people value or desire about an area, and their sense of place.

People's sense of place is directly tied to the characteristics of an area, including the area within a road corridor, that invoke a special feeling or attachment to the area. Factors may include the area's vegetation, fish and wildlife resources, amount of sunlight available, views, solitude, opportunities that make it a destination, and the overall familiarity to an individual or group. Roads often facilitate a person's enjoyment of the area by providing for driving comfort, the amount and type of use, and any number of aesthetic attributes visible alongside the road. Sometimes the road itself is the place a person enjoys. People have local name for specific roads, they enjoy driving specific routes, and consider such driving activity a part of their connection with an area. These attributes are directly related to road management. Any changes in this management will likely change people's sense of place and impact current uses.

Some places are significant enough to individuals, groups, or communities that if the opportunity to use a specific site is lost, the continuation of those activities no longer takes place – there is no substitute site for the activity because the site itself is the reason people participate. The presence or absence of substitute sites, and the potential displacement of people from their 'chosen' site should be considered.

For example, if a road is managed as a Level 3 and the decision is made to upgrade it, more and different users might begin to use the area. This will change the character for users who consider the area to be special; it will change their experience and may displace current users to other areas for their recreation. Likewise, if a road is currently managed as a Level 5 and the decision is made to downgrade maintenance, the road will not be easily drivable, and the area becomes inaccessible for some current users. This problem is especially evident for the elderly, a group that has used the area for years. Rough roads are hard on bones, and users have to be considered in these decisions. Because a variety of different people use the existing road system, they need to be considered before changing road management.

SI (5): What are the current conflicts between users, uses, and values (if any) associated with the road system and road management? Are these conflicts likely to change in the future with changes in local population, community growth, recreational use, resource developments, etc?

Conflicts often occur between different types of users - - motorized vs. non-motorized, hunting/fishing vs. non-consumptive users, recreational users vs. tourism, and resource preservation vs. resource extraction. Understanding these conflicts provides needed context for road management, enabling decision-makers to predict the social effects of their decisions with regard to existing conflicts. It will also help decision-makers to formulate road management decisions that may help resolve or mitigate these conflicts.

Most of the conflicts on the ARP are either about the high clearance roads (maintenance level 2) or about the unclassified roads. These conflicts will be addressed at the watershed- or project scale roads analysis.

Cultural and Heritage Resources (CH)

CH(1): How does the road system affect access to paleontological, archaeological, and historical sites and the values people hold for these sites?

The Arapaho and Roosevelt National Forests and Pawnee National Grassland road system increases access to both identified and unidentified historic and paleontological sites. Increased or improved access can result in vandalism, illegal collection activities, and possibly illegal excavation of historic or paleontological resources. In addition, road construction or decommissioning activities may adversely affect cultural resources (although these effects would be mitigated on a project-level basis in accordance with the National Historic Preservation Act, as amended). Access to these sites allows native Americans to access their cultural heritage sites and also allows other forest visitors and researchers opportunities to learn about and enjoy their cultural heritage.

CH(2): How does the road system affect cultural and traditional uses (such as plant gathering, and access to traditional and cultural sites) and American Indian treaty rights?

Currently, no specific locations of traditional uses have been identified on the ARP. The road system neither prohibits nor encourages access to, or use of, traditional areas. No treaties exist that include specific treaty rights on lands managed by the ARP.

CH(3): How does road use and road management affect roads that constitute historic sites?

Several roads, trails, and bridges on the ARP have been evaluated as eligible for the National Register of Historic Places. Continued use of such roads, within historical alignments, helps to preserve the historical integrity of these historic properties. Potential adverse effects caused by closing these roads would have to be considered on a project-level basis in accordance with the National Historic Preservation Act (1966), as amended.

Civil Rights and Environmental Justice (CR)

CR(1): Is the road system used or valued differently by minority, low-income, or disabled

populations than by the general population? Would potential changes to the road system or its management have disproportionate negative impacts on minority, low-income, or disabled populations

The road system is used by all groups of people. Because the maintenance level 3, 4, and 5 roads are all accessible by passenger cars, there are no disproportionate negative or positive benefits to any populations. This would not necessarily be the case for the maintenance level 2 roads, which are the four-wheel drive roads on the ARP. These level 2 roads would require purchase of more expensive four-wheel drive vehicles, which may prohibit low-income populations from using these roads. This question will need to be considered more closely during the watershed- or project-level roads analysis.

The ARP does not discriminate against any group or persons based on color, creed, abilities, nationality, income level or background. All persons are treated equally in policy and management of the National Forests and Grassland. Travel management is no exception. The rules, standards, and laws that govern how the travel system is developed and used apply equally to all that use it.

The policy holds true for persons with a disability. According to direction set forth in

'Section 504 of the Rehabilitation Act of 1973
"No otherwise qualified person with a disability* in the United States shall, solely by reason of his disability, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance or under any program or activity **conducted by any Federal Executive agency or by the United States Postal Service".**

7CFR 15e.103(iii)(2)
"Further the person with the disability must be able "to achieve the purpose of the program or activity without modifications to the program or activity that **fundamentally alters** the nature of that program or activity".

It should be noted that the term **"reasonable accommodation"** is only used in reference to employment, there is no such requirement for program access.

OHV access by persons with disabilities:
There is no legal requirement to permit a person with a disability to utilize an OHV in any area

that restricts or prohibits OHV use under the Forest Plan or the Forest Travel Plan/Transportation Plan.**'**

' ' *Source: Document produced by Janet Zeller, Interim National Accessibility Program Manager on Issue: Legal requirements re accessibility and UDSA Forest Service Programs*.

The ARP allows **wheelchairs** to go anywhere on the Forest, unrestricted.