



CHACO ROADS

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Introduction

The famous prehistoric roadways have an important role in research on the Chaco Anasazi. Not only do they provide insight into the development of the so-called "Chaco phenomenon," but the roads also pique the curiosity of the general public, as witnessed by the publication of a popular book on the topic (Gabriel 1991). The public and archaeologists alike are mystified by the great width and apparent length of roads in a culture that did not have wheeled vehicles or pack animals. The use of cutting-edge remote sensing technology to investigate the roadways has further stimulated interest in the topic (Lyons and Hitchcock 1977; Obenauf 1991). This curiosity, however, has had a dark side, for there has been a tendency to accept scenarios of road development and function without careful consideration of the available evidence. This brief paper hopes to contribute to the research on Chaco roads by providing a detailed description of what is known about this fascinating but controversial cultural feature.

Road Morphology

Archaeologists have focused on a large number of attributes in order to distinguish prehistoric Chaco roads from the many historic roads found in the region. Nials (1983; Nials et al. 1987) presents the most comprehensive discussion of road morphology that considers numerous factors, including width and depth, roadbed preparation, longitudinal profile, topographic expression, and border elements. The following discussion focuses on those features that characterize most identified Chaco roads.

Chaco roads are notoriously wide, with most ranging 8-10 m in width, but there is considerable variability. Nials (1983) notes that the larger, well-defined roads located near major sites average 9 m in width, while isolated "spur" roads tend to measure half this. A single roadway can be much wider near an architectural site, but then narrow to a mere 2 m and exhibit few distinguishable features in remote areas where the terrain is more restrictive. Determining the depth of Chaco roads has also proven to be difficult. Many suspected roads exhibit significant amounts of gullying, while border elements such as large berms exaggerate the actual depth below ground level. In fact, the majority of

suspected roadways have no topographic expression at all, either because they were never excavated into the surface during road construction or because natural processes have destroyed them (Nials 1983:6-15). Less frequent are roads that were excavated to hard-packed soil to form a roadbed; these range 10-50 cm in depth (Vivian 1995:17). A few road segments were actually excavated into sandstone bedrock, apparently in order to delineate the road.

Nials (1983:6-21) notes that one of the most striking characteristics of Chaco roads is the highly variable elements that often border the roadways. Border elements range from spaced stones to crude masonry walls to large earthen berms. Most common is a low earthen or stone curb that likely formed during road preparation or cleaning (Vivian 1995:18). More unusual elements include walls of shaped masonry and grooves that were cut into sandstone to define roads as they traversed bedrock (e.g., Windes 1991). Most borders do not extend beyond 50 m, and a single road segment may have several different border elements. Some roads may exhibit a border only on one side, or two different elements may exist on opposite sides of a road.

Longitudinal profiles of Chaco roads illustrate that they were normally "terrain-following" rather than graded. However, there are several examples where roadways were leveled by removing fill from high points, filling in low points, or using a cut-and-fill method utilizing both techniques (Nials 1983:6-10-6-12). More extensive treatments such as raised beds, stairways, or ramps are even more unusual, and those that have been identified are primarily located in and immediately around Chaco Canyon (Vivian 1995:18-19). Stairways are either cut directly into sandstone cliffs, or the steps are constructed of masonry and fill. Ramps along Chaco roads do not usually completely ascend obstacles, but instead provide platforms for stairways or foot- and hand-holds (Nials 1983:6-12).

One of the most often cited characteristics of Chaco roads is their linearity. Many segments proceed in a straight line, often disregarding local topography. However, as Nials (1983:6-27) describes, "reportedly straight roads actually consist of a series of approximately aligned straight segments, which together often produce a straight trend for a larger portion of the road...Major course adjustments are usually in the form of an abrupt change (dogleg)." In a few cases, roads employ ramps or staircases to go over obstacles rather than going around them. The North Road is often considered to be the best example of this linearity, for it proceeds on a nearly perfect northerly direction for 50 km. However, perceptions of linearity can be colored by the straight lines that archaeologists draw on maps and label as "projected alignments" when the actual roadway cannot be identified (e.g., Stein 1983:Figure 8-4). Furthermore, there are numerous examples where roadways do curve or go! around obstacles, such as the segment near Standing Rock Herradura (Nials et al. 1987:110), the roadway south of Muddy Water (Nials et al. 1987:140), and the Ahshislepah Road between Escavada Wash and Ahshislepah Wash (Stein 1983:Figure 8-7; see also Windes 1991:Figure 11.3). Winding road segments are especially common in areas outside of the relatively flat San Juan Basin. Despite these

caveats, however, most Chaco road segments do tend to maintain a high degree of linearity.

An especially puzzling characteristic of Chaco roads is the construction of parallel road segments, which have been identified at places along both the North and South Roads. An extreme example is located north of Pierre's Ruin on the North Road (Nials 1983:6-29). Here, four segments spaced less than 40 m apart appear to be almost perfectly parallel. Little is known about these strange features, but evidence does indicate that one of the parallel segments typically exhibits significantly more use than its counterpart.

Road Accoutrements

A variety of cultural features are commonly associated with suspected Chaco roads. These features are usually located adjacent to roadways, and their function was undoubtedly closely tied to the function of Chaco roads. However, definitively establishing the relationship between road-associated features and the roads is often difficult since the roads cannot be easily dated. In fact, many cultural features located on Chaco roads were abandoned before the roads were constructed (e.g., Casa Patricio on the South Road) or built after the Chaco period (e.g., Gray Ridge Compound on the alleged Coyote Canyon Road). This serves as a warning that we cannot automatically assume that features physically located near roads were functionally associated with the roads.

Nials et al. (1987) present the most detailed examination of road-associated features. They list seven architectural forms common to Chaco roads: herraduras, avanzadas, zambullidas, earthworks, platforms, great houses, and great kivas. This discussion will focus on the first five; the latter two are discussed separately in another online paper. Another feature, the Windes' circular shrine, is also often considered to be associated with Chaco roads, but a recent study suggests that these small shrines are not part of the road complex (Kantner 1997).

Herraduras are circular to horseshoe-shaped enclosures that usually measure 5-7 m across. The low masonry walls are normally open on one side, and the majority of examples are oriented towards the east. These structures almost always open onto the surface of Chaco roads, and they tend to be situated at topographic breaks, although Nials et al. (1987:13) note that not all breaks along roads exhibit herraduras. Both the zambullida and the avanzada categories are more vaguely defined. The former are generally considered to be masonry structures that are intermediate to herraduras and great houses. The massive walls are usually lower than those found in great houses, but like great houses, they tend to exhibit multiple rooms. The avanzada is a catch-all category that includes "minor architectural perturbations in the vicinity of prehistoric roads" (Nials et al. 1987:14). Both of these categories may well be variations of the herradura.

Earthworks are often physically associated with roads as they approach great houses. These features, composed of mixed midden and fill, appear to be placed so as to delineate

the North Road in this area assumedly has been destroyed by natural processes or was never formally defined using a constructed roadbed. A similar situation exists for the South Road, which was also checked on the ground (Nials et al. 1987). Like the North Road, the 51-km South Road projected from Chaco Canyon to Hosta Butte is characterized by segments of constructed road separated by long stretches where no roadway could be identified. Although the separate segments for both major roadways seem to align on the projected routes, it is important to remember that neither route can be verified to have been a long, continuous, constructed road.

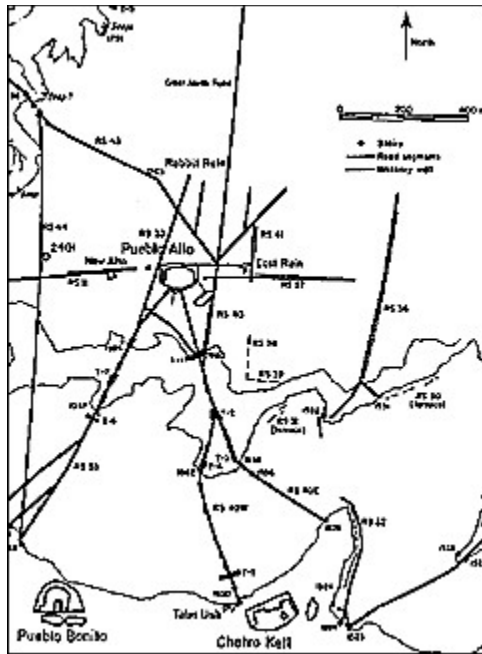
Further archaeological investigation has demonstrated that several of the remaining projected routes are not the lengthy Chaco roadways they were once believed to be. For example, the alleged Southeast Road from Chaco Canyon to the San Mateo Ruin and the Mexican Springs Road to the west could not be verified despite intensive ground survey (Nials et al. 1987:20). For other roadways, only short segments of constructed road have been identified along their proposed routes. Examples include the Coyote Canyon Road extending from Chaco Canyon southwest into the San Juan Basin and the Ahshislepah Road running northwest from the canyon to Black Lake (Nials et al. 1987). Whether the short segments located along these routes confirm the presence of lengthy roadways connecting Chaco Canyon with other parts of the San Juan Basin is still uncertain.

While confirming the existence of long, continuous roadways emanating from Chaco Canyon has proven to be a difficult endeavor, archaeologists have identified an increasing number of short and seemingly unconnected road segments located throughout the northern Southwest. Roney (1992) recently listed all of the prehistoric roads associated with the Chaco Anasazi. Many of the 70 road segments that Roney lists are concentrated in and around Chaco Canyon (see also Windes 1991), but probable segments are also found as far away as eastern Arizona, southwestern Colorado, and southeastern Utah. The number of these disjointed segments keeps growing; as many as 21 new segments were recently identified in the area around Aztec Ruin (Stein and McKenna 1988).

Most short road segments are associated with great houses or great kivas, with one terminus often contiguous to the structure. These segments then seem to disappear after proceeding a short distance of usually not over 3-4 km. This could indicate one or a combination of three scenarios:

- 1) the roads once extended further, but they have since been destroyed;
- 2) formally constructed roads never extended any further than the extant termini, but the routes projected beyond the constructed roadway were still used;
- or 3) the roads never extended further, and people never traveled beyond the current termini. In support of the latter scenario, numerous short segments proceed short distances to springs, shrines, or other local features (e.g., Windes 1991:120-122; Kantner 1997). Fowler and Stein (1992) also note that many short road segments in the area south of

Chaco Canyon appear to have connected occupied great houses with older, abandoned Chaco architecture located nearby, although this pattern may postdate the Chaco period.



The overall picture of prehistoric road distribution in the northern Southwest seems to indicate two different types of roadways. The first, characterized best by the North and South Roads, is the long "artery" extending from Chaco Canyon to outlying areas on the edges of the San Juan Basin. The second type of road is the segment that seems to emanate from a great house or great kiva and extend only a short distance. The latter is associated both with architecture in Chaco Canyon itself and with the numerous great houses and great kivas scattered over the northern Southwest.

Dating Chaco Roads

Developing a clear understanding of the function of Chaco roads requires accurate dates for the various segments. However, dating roadways has proven to be difficult. In general, few artifacts can be definitively associated with outlying roadbeds, leading archaeologists to rely on the dates of nearby architectural features to determine when roads were in use. The result is that the proposed dates for most Chaco roads are not very precise or dependable.

Kincaid et al. (1983:9-34-9-46) attempted to date the North Road, South Road, and the Ahshislepah Road using mean ceramic dating on small collections associated with each roadway. They concluded that the South Road generally dates to the A.D. 900s, while the North and Ahshislepah Roads date to the late A.D. 1000s. Recently, Windes (1991:125-126) employed a more accurate multidimensional scaling analysis to date the relatively artifact-rich road segments in Chaco Canyon. The results indicate that most of these roads date to the latter part of the A.D. 1000s and the early A.D. 1100s. Windes' study included a short segment of the South Road, and in contrast to the 1987 study, he concluded that this segment dates to the late A.D. 1000s. The general impression from the few studies that have dated Chaco roads is that a few may have been built in the early A.D. 1000s, but that the majority were constructed after A.D. 1050 and were mostly unused after A.D. 1150 (see also Nials et al. 1987:25).

Conclusions

Research on prehistoric Chaco roads is currently undergoing major changes. Because many of the alignments identified during aerial reconnaissance are in fact historic roads (e.g., portions of the Southeast Road), there is now less of a tendency to project alignments all over the San Juan Basin without first evaluating the evidence on the

ground. Archaeologists realize that the "connect-the-dots" approach is dangerous in the face of increasing numbers of identified segments over a larger area of the Southwest. As a result, a series of new questions are beginning to emerge, a few of which are summarized here:

- 1) What makes a prehistoric alignment a "Chaco road?" Are there roadways that were not associated with the Chaco Anasazi, such as the Salt Mother Road near Zuni or the post-Chaco "roads through time"?
- 2) How is each road segment related to the overall cultural landscape? Most Chaco roads have been investigated using a narrow survey corridor, but clearly other nearby settlement patterning is relevant to understanding the function of roads.
- 3) Did all of the projected road segments actually exist? The tendency has been for archaeologists to explain missing road segments by alluding to various geomorphic processes. Scholars should more carefully consider where projected roadways should still appear, where they might be buried, and where they should have eroded away.

These and many more questions remain for archaeologists to consider as the investigation of Chaco roadways progresses.

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