

***Cell Phones, Center Pivots, and Rural Repopulation:
Planning Implications of the New Ponderosa***

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With each successive wave of technological innovation land use planners and resource managers confront new service demands which spin off a host of issues and problems. The automobile, the most prevalent example, has reshaped and distended contemporary cities and compounded the need for comprehensive planning. More recently, the adoption of a series of communications technologies has triggered a new era of rural growth, commonly known as the "rural rebound." (Johnson, 1999) Fax machines, personal computers, satellite links, E-mail, and even the annoyingly ubiquitous cell phone afford citizens the opportunity for choice in residence location, making them so footloose that agricultural communities marked by decades of sustained population drain are experiencing unprecedented growth rates.

The influence of communication and information innovations is widely apparent; less understood is the role of agricultural technologies in the re-peopling of rural America. This is counter-intuitive. For decades innovations in the agro-economy have sent surplus labor to the cities. However, mechanization of irrigation, and specifically, the advent of the Center Pivot Sprinkler is an exception. This device draws local planners into a classic confrontation between rival interest groups to determine the best use of productive farmland. Among the issues are agricultural practices, environmental quality, and the compatibility of sometimes-conflicting lifestyles. In this volatile arena, the local land use planner is regularly called to be strategist, referee, judge, and policeman for the enforcement of the legislated public good.

A Technological Niche

To those who have never seen a Center Pivot Sprinkler (other than from a high flying jet), imagine a gigantic lawn sprinkler, one capable of irrigating two hundred acres and more with only occasional human assistance. In the nation's semi-arid and

arid regions, this technology represents the classic substitution of capital for labor in order to achieve more efficient water use. Moreover, the shift from traditional labor-intensive irrigation methods to these computerized rainmakers markedly reduces farming's physical toil, an appealing prospect for an aging generation of farmers.

Apart from well drilling, pond construction, and the laying of water and power lines, a basic sprinkler begins at approximately \$100,000. Add the cost of energy to pump the water and propel the sprinkler, maintenance and repair, and replacement every fifteen to twenty years, and the scope of a farmer's financial commitment becomes a bit more evident. Despite such costs, the proliferation of these ingenious devices - - now watering approximately 40 percent of all irrigated land in the U.S. - - is more rapid than for any other system of irrigation.

With every innovation, adjustments are necessary if the new technology is to integrate successfully into the existing culture and landscape. With the Center Pivot Sprinkler, a particular challenge is to accommodate the circular watering pattern to a landscape of rectilinear farms and fields, especially common in western states where the devices are most common. Consider, for example, how a sprinkler fits on a standard unit of land, a quarter section (160 acres). Where the land survey system creates a grid of mile square sections (640



Figure 1

acres), public roads crisscross at one-mile intervals. Within this pattern the quarter section will typically be a square, each side one-half mile long. Farms or fields of 160



Figure 2

acres will have two adjacent sides bounded by public roads and two by fence rows and/or abutting fields.

Assuming one seeks to refrain from watering public roads or the neighbor's property, a sprinkler with its pivot placed at the center of the field can adequately irrigate approximately 130 acres. Initially, at least, some farmers felt the loss of 30 acres was excessive, especially in view of the high start up cost of the system. Unirrigated, however, the corners produce little except weeds and an unkempt appearance. Yet when tilled to control weeds, dry corners become a net loss. Weed control is not just a matter of compulsive "farmer culture" and personal pride, but practical economics since weeds will spread to the rest of the farm and nearby neighbors.

Few farmers find it practical to irrigate these small, odd shaped dry corners apart from some modification of their sprinkler systems. Thus to even a casual observer of contemporary mechanistic American culture, it should be no surprise that problems arising from technology are most often addressed by more technology. One relatively simple option is to fit the sprinkler with an end gun, a high-pressure, long-distance nozzle programmed to start and stop at specific points, thereby reaching into the dry corners. But even an end gun,

because it travels in a circular arc, fails to reach the entire corner without sending water beyond the field's boundaries. If scaled back to prevent over watering, part of the corner remains dry and unproductive. A more complex solution is a "corner system" that attaches to the primary sprinkler arm but trails behind. This alternative is programmed to extend outward as the main sprinkler approaches the corner and to retract once the corner is passed.



Figure 3

Corner systems require separate wheels and motors, a more powerful pump, additional nozzles, and much more complex programming to coordinate their operation. Consequently, this add-on inflates the base cost of a sprinkler a full 50 percent, or approximately \$50,000. With this investment only an additional five acres can be watered in each corner, but at an added equipment cost of approximately \$1000 per acre. Simply stated, production from the four detached plots will not offset the added



Figure 4

expense. Also, these corner systems occasionally go awry owing to programming glitches, mechanical failure, or tracking problems, sending expensive equipment to tangle with fences, careen into ditches, or even climb onto the county road. After an initial popularity, sprinklers with corner systems have lost comparative appeal.

For most of the forty-year history of functional center pivot sprinklers, dry corners have been a frustration, even a nuisance; one might consider them the price paid for innovative technology. Moreover, it is possible to attribute to the Center Pivot a minor part of the blame for rural depopulation. Sprinklers set people free (or push them) to seek their future away from agriculture, and commonly away from rural America. Yet, when linked to the set of communications' innovations mentioned earlier, the impact of computer-driven, automated irrigation is reversed, and as will be shown, aids and abets the rural rebound. The small corner plots that once were considered unfit for serious farming have become a hot commodity, a rural residential niche on the way to becoming a ranchette.

Country Living?

In established irrigation districts created by heavy investments in water and water engineering, there is a tradition of attempting to protect prime farmland from urban sprawl and encroachment. Many states and counties seek to direct aspiring rural rebounders into existing small towns, many of which have experienced population decline and now provide affordable alternative housing sites. It is further reasoned that such towns already possess facilities to provide new residents with necessary services without sacrificing farm or ranch lands. This arrangement bolsters the economic well being of the small town while giving new arrivals something that approximates "country living." To this end, minimum parcel size criterion for agriculturally zoned land, typically thirty-five acres but sometimes more, is imposed to

discourage parceling. A second approach is creation of urban growth boundaries that facilitate residential development within the designated zone and maintain restrictions beyond it. Despite these preservation tools, many people persist in their pursuit of their "***Personal Ponderosa***" and are often willing to sacrifice service levels and challenge governmental regulations in order to experience the allure of country living.



Figure 5

Minimum parcel size is typically administered in conjunction with specific exemptions to the general rule. Original owners of farm and ranch land, their immediate family members, and hired workers directly involved in the farm or ranch operation, are entitled to parcel-off home sites. But even such exemptions are laden with restrictions controlling how frequently an owner may create a second interest or split off a piece of property for residential sale. These limitations vary, but usually range between five and ten years.

A second category of exemptions to minimum parcel size permits the conversion of "less important" farm or ranch land, thereby establishing a hierarchy of developable lands. Functionally, corner parcels left by center pivot irrigation may fit this lower priority categorization. The planning premise underlying both restrictions and exemptions is preservation of agriculture, protection of resources, and conservation of rural environments by

preventing the piecemeal creation of de facto rural subdivisions.

Initially, small corner parcels were purely serendipitous from a realty point of view. Farmers and ranchers were often surprised when asked to “sell off a corner.” The novel experience of being offered what seemed a significant sum of money for non-productive land prompted some farmers and ranchers to listen. And even for those adamantly opposed to fragmenting their properties, the weak farm-and-ranch economy made such unsolicited offers tempting. Some who sold did so only in order to continue farming, to cover previous crop losses, or to pay for the “wife’s cancer treatments.” However, what began as a buyer’s market rather quickly shifted to a seller’s. Quite naturally it occurred to some that selling off a corner or two left by the center pivot was a logical means of defraying part of the cost of that investment. It is at this point that public policy becomes involved because many potential buyers and some landowners are not aware of state or local restrictions concerning subdividing agricultural land, or at least pretend not to be. Simultaneously, public policy and local planners are involved when a significant portion of the new rural residents, the ranchettes, discover they are uninformed or ill-prepared for the rural life, with its limited services, unfamiliar farm and ranch practices, and frequent demands on their pocketbooks and patience. Indeed, it is the planner who usually hears the first complaint whether it comes from the newcomer or the old-timer.



Figure 6

In the past five years conversion of sprinkler corners to residential use has entered a new chapter. It is now a standard strategy for some farmers and ranchers who wish to finance or expand their operations. Clearly, the marketing of sprinkler corners is standard operating procedure for speculators and the real estate community as they capitalize on national interest in living in places that are perceived as smaller, quieter, cleaner, and safer.

The conversion of sprinkler corners raises tough questions. Previously, most farm corners were productive and public policy usually dictated their protection. However, the language of land use regulations, as well as the content, typically leave some latitude for interpretation. One question that must be addressed is whether sprinkler corners are viewed in their inherent state, i.e., productive farmland, or as obsolete lands resulting from a higher and functionally improved irrigation technology. Where owners seek to sell a parcel that has never been irrigated or is incapable of being irrigated, or where cultivation is limited by rockiness, high water table, or other conditions, the planning decision is less complicated. But use conversion owing to technological change is less easily defined and defended. Compounding all decisions are short-term versus long-term perspectives and entrenched attitudes ranging from anti-growth to anti-planning, and virtually every position between.

The question of community good in this context, or any land use debate, is often swayed by local sentiment and personal interest. Planners are lobbied by groups ranging from property rights advocates, to no growth constituents, to aspiring country dwellers. Planners also find themselves the target of criticism from one group for interfering with an individual’s “right” to do what they wish with their personal property, and from another for denying anyone the “right” to live where they wish. It is also asserted that planners are frequently outsiders whose education, non-local

heritage, and environmental agendas make them poor arbiters of what is good for a rural community. Finally, additional issues emerge when elected officials with authority over planning agencies do not share the same attitudes about planning for growth, the environment, or ultimately, the established land use ordinances in force.

Ranchettes

The recent proliferation of new home sites in rural America raises complex land use planning issues. Often termed “ranchettes,” these small, dispersed tracts of land account for an increasing portion of the rural rebound. Participants and supporters of this rural-ward migration contend that this is an exercise of a fundamental right, that is, to live anywhere one can afford. They hasten to add that their entrance into rural communities increases the taxable base and injects money into local economies that have struggled or even been in decline. And, they add, the land actually taken up is essentially non-productive so there is minimal impact on agricultural production. A moot point, some contend, in light of large agricultural surpluses in many commodities.

While public opinion seems to generally favor a *laissez faire* policy regarding all real estate, there are exceptions. These include organizations like the American Farmland Trust and sundry environmental groups, as well as long-term rural and small town taxpayers suddenly facing bond issues for new schools, better roads, and professional fire protection. Opposition from the latter citizenry is not so much opposition to new population, but to the rate, distribution, and manner of the growth. But more than a decade into the rural rebound there appears little slackening even though the price of a five-acre sprinkler corner has risen from perhaps \$10,000 to \$50,000 or more. Comparatively, however, this is still acceptable since it is about the price one might expect to pay for an urban building site of one-third to one-half acre.

Owing to its specific location, the sprinkler corner ranchette is an inherently challenging new land use practice. First, the parcel is immediately adjacent to actively farmed fields. This means its occupants must be prepared for the realities of modern, large-scale, intensive farming. The ranchettes are likely dealing with a farm operator who is managing many acres, much equipment, and hired labor, primarily equipment operators. It is not Old McDonald just across the fence. The anticipated “quiet country living” often includes large, noisy, dust-raising equipment throughout the day, well into the night, and most of the year. Feedlots and dairies contribute their charm to country living with noise, dust, and smells that are both alien and offensive to those unaccustomed to modern agriculture. This development has prompted one rapidly growing Colorado county to produce and distribute *The Code of the West*, a pamphlet whose intent is to minimize misunderstandings between agricultural and ranchette interests. In fact, most impacted rural communities now issue warnings to prospective new county dwellers as a matter of course.

While communications technologies provide a degree of residential freedom, the fact remains that most ranchettes are still city bound to a degree, some commuting every workday. But even when it is an occasional trip to the office or hauling kids to the orthodontist and soccer practice, roads take on a critical importance to newcomer and old-timer alike. Sharing a two lane county road, paved or not, with large feed, grain, and manure trucks (not to mention slow moving tractors towing massive implements) requires a willingness to adapt to pot holes, delays, and dust. If the new home site is a sprinkler corner, the issue is twofold. First is a quantum increase in the number of so-called “blind” corners caused by buildings, fences, and trees. When this is compounded by a significant increase in traffic volume occasioned by new growth, frustrations and fatalities both

rise. Speed, always a risk factor, has clearly increased with more long-distance commuters who tend to travel either early in the day or late in the evening. (Lucy, 2000) More governmental intervention seems the likely response to road and traffic woes but hardly anyone, farmer, truck driver, or ranchette commuter favors impeding the traffic flow, not to mention higher taxes for road improvements.

Beyond issues of traffic or the condition of roads, an ongoing debate exists concerning the compatibility of ranchettes with intensive irrigated agriculture. The discussion can be joined at the corner café or followed in the local daily; occasionally, it finds its way into national news sources. Distilled to its essence it concerns the methods of modern large-scale agriculture and the ranchettes' vision of country living, and whether these can co-exist in close proximity. At the core of contention is the unwillingness, or inability, of established farming and ranching operations to change their way of doing business, despite the urging of their new neighbors to do so. High on the list of contested practices are storage and use of manure, use and manner of application of agricultural chemicals, field and ditch burning, feedlots, and the virtual round-the-clock use of large equipment at certain seasons. Farmers and ranchers respond with their own list of grievances: loose animals, especially dogs, use of fields for horse riding, failure to control weeds, out-of-control fires, the "borrowing" of irrigation water, theft of hay, or trash disposal in irrigation ditches. At a personal level such unresolved conflict may mean nothing more than hard feelings and mutual annoyance between adjacent property owners. If the discord escalates local planners or the planning agency are frequently summoned by one party, or both, seeking support for their position, though the authorized role of local government and its staff is often quite limited in resolving these disputes. Unfortunately, aggrieved citizens often carry their complaints to law

enforcement, lawyers, and ultimately the courts.

The New Suburbs?

Where ranchettes scatter across the countryside in significant numbers a situation arises impacting all local residents, recent and otherwise. In more than eighty case studies around the U.S. it has been demonstrated that low-density residential land use does not pay its way. Intuitively, it would seem that the corner of a field will yield more tax revenue if used for a home site than growing crops (not to mention weeds!). And this can be easily documented. In fact, as home sites multiply property taxes go down because the tax

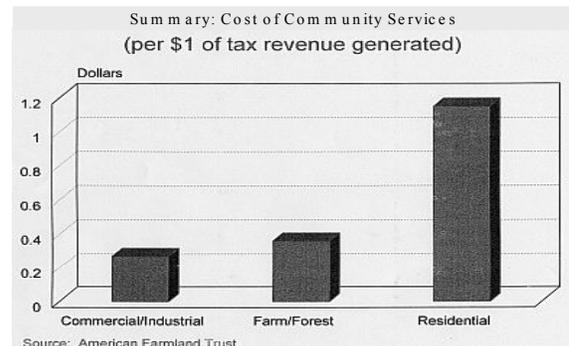


Figure 7

base is raised. What is less apparent is the negative balance between revenue generated and the cost of required infrastructure and services to accommodate this form of land use change.

The relationship of tax revenue to cost of services is graphically depicted in. While the figures represent the median values from the case studies mentioned earlier, the total range of costs for residential community services varies from a low of \$1.02 (per \$1.00 of tax generated) to a high of \$2.11. (American Farmland Trust) Not once in eighty-three community studies, conducted in eighteen states, did rural residential land use give back to public coffers as much as it demanded. The low-density development that imparts much of the charm to country living, the "peace and

quiet” sought by ranchetters, stretches services and community resources. Road maintenance and improvement, domestic water supply, phone and electrical service, mail delivery, fire protection and law enforcement all experience increased levels of demand. Stated in another fashion, when rural rebounders speak of “**getting away from it all**,” few have in mind paved roads, next-day delivery, or quick response to emergency calls as aspects they wanted to leave behind.

The conventional wisdom is that houses increase the tax base and you can make more money growing houses than corn or cattle. On a case-by-case basis and in the short run this is a difficult argument to refute, especially in communities with economies that are in trouble. However, planners must be able to project land use trends into the future and assess the long-term impacts upon not only the local economy, but also resources and the environment, and the quality of life for all citizens. Planners must also consider issues like the “tipping point,” that future time when ranchettes could outnumber farms and ranches in a community with a resulting shift in the local political power base, and potentially, fundamental changes in attitudes and policies regarding farming and ranching practices. (Smith and Krannich, 2000)

What lies beyond such a tipping point? One scenario might be described as a dispersed, low-density suburb with significant farming surviving only in isolated islands. Even in such enclaves of agriculture, legislated restrictions for the common good would increase both the difficulty and the cost of farming and ranching. Meanwhile, public service demands could be expected to grow as the now majority ranchetters sought to bring something near urban-quality services to their New Ponderosa. (Nelson, 1992)

Unfortunately, the implications for retaining a sense of rural culture, for conserving open vistas, for wildlife protection, for soil and water quality, and

control of plant and animal pests, are not promising in the long term. And if the critics of suburbia are correct when they charge that a sense of community is unlikely within low density commuting neighborhoods, what are the prospects that socially viable neighborhoods will emerge from dispersed commuting ranchetters? (Kunstler, 1993)

Planning Implications

Planners are challenged daily by evolving land use practices and patterns. Nowhere is this truer than in the case of the rural rebound, which literally caught most of us off guard. With no prospect for an end to innovations in communications technology nor in agriculture, we should expect the demand for “Country Living” to continue and grow. Should the rural economy continue to falter, opportunity for the rural rebound will only expand.

Most local planning offices in the Colorado Front Range are in a chronic catch-up mode. Ironically, proposed legislation to help manage local land use often sparks a modern day land rush as aspiring rebounders, and those who wish to serve that market, converge upon the Planning Office to beat deadlines. But it is not merely the volume of work that may frustrate good planning, but the very nature of the rural rebound. Consider the two primary populations involved. Traditionally, farmers and ranchers have bridled at what they consider excessive restrictions upon “their” freedoms from government programs intended to benefit them. Consequently, when the planning office involves itself in land sales and use, it seems but another example of “too much government.”

As for the rebounders, they have aspirations of a simpler, more self-sufficient lifestyle. Whether returning to the countryside, or merely following a dream, land use restrictions do not fit into their vision of this new rural lifestyle. In essence, then, the planner must deal with at least two potentially resistive parties that have very different experiences and frames of

reference. In this context, not only is the planner to function as interpreter and enforcer of existing regulations, but also may be expected by either party (or both) to interpret the “strange” behavior of the other.

What fundamental role can planners and planning play in this contemporary drama beyond trying to deal with daily demand while hopefully reducing the backlog of work? Two things seem essential:

1. There must be a graphic ongoing means to inform the public about the magnitude of rural land use changes that have already occurred. These must be the basis for addressing the social, economic, and environmental impacts that attend such changes.
2. Planners and policy must continue to hold a view and vision of rural land use that provides for the well being of future generations, not the satisfaction of whomever walks through the door on any given day.

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