Schroader, Kathy

From:	Cnty Board of County Councilors General Delivery
Sent:	Tuesday, April 05, 2016 7.33 AM
To:	Mielke, Tom; Madore, David; Stewart, Jeanne, Olson, Julie (Councilor); Boldt, Marc
Cc:	McCauley, Mark, Schroader, Kathy, Redline, Tina
Subject:	Comments for County Council RILB public hearing April 5
Attachments:	Futurewise Comments for County Council Public Hearings on RILB April 4 2016 Final pdf

Please disregard if this message is a duplicate. For the record.
Linnea

From: Tim Trohimovich [mailto:Tim@futurewise.org]
Sent: Monday, April 04, 2016 3:41 PM
To: Cnty Board of County Councilors General Delivery; Cnty 2016 Comp Plan
Subject: Comments for County Council RILB public hearing April 5

Dear Sirs and Madams.

Enclosed please find our comment letter for the April 5, Rural Industrial Land Bank public hearing It also includes two of the enclosures. We are sending other enclosures in two separate emails Thank you for considering our comments.

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April 4, 2016

The Honorable Marc Boldt, Council Chair
Clark County Board of County Councilors
PO Box 5000
Vancouver, Washington 98666-5000

Dear Council Chair Boldt and Councilors Madore, Mielke, Olson, and Stewart:

Subject: Comments on the proposed Rural Industrial Land Bank for the Board of County Councilors April 5, 2016 public hearing.
Sent via email to: boardcom@clark.wa.gov; comp.plan@clark.wa.gov

Thank you for the opportunity to comment on the proposed Rural Industrial Land Bank. We urge the Board of County Councilors to deny the Rural Industrial Land Bank because it is unneeded and will pave over working farmland.

Futurewise is working throughout Washington State to create livable communities, protect our working farmlands, forests, and waterways, and ensure a better quality of life for present and future generations. We work with communities to implement effective land use planning and policies that prevent waste and stop sprawl, provide efficient transportation choices, create affordable housing and strong local businesses, and ensure healthy natural systems. We are creating a better quality of life in Washington State together. We have members across Washington State including Clark County.

The Rural Industrial Land Bank is unneeded because land suitable to site the major industrial development is available within Clark County's existing urban growth areas and therefore the Rural Industrial Land Bank violates the Growth Management Act (GMA)

The Growth Management Act (GMA), in RCW 36.70A.365(2)(h), provides that one of the requirements for a "major industrial development" is that "[a]n inventory of developable land has been conducted and the county has determined and entered findings that land suitable to site the major industrial development is unavailable within the urban growth area." RCW 36.70A.367(2)(b)(i) applies this requirement to major industrial developments with master planned locations. The *Addendum* identifies land suitable for major industrial development in the existing urban growth areas.[1] The *Clark County Rural Industrial Land Bank Responses to SEPA Comments Planning Commission Proposal*, 2-1, does not dispute that there are sites within the

[1] *Clark County Rural Industrial Land Bank Programmatic Environmental Review pursuant to RCW 36.70A.367(2)(b), and Addendum to the Clark County Comprehensive Growth Management Plan Final Environmental Impact Statement* (October 2015) pages 13 and 14 of the *Addendum Part I: Inventory* accessed on April 4, 2016 at: https://www.clark.wa.gov/community-planning/rural-industrial-land-bank. Hereinafter referred to as the *Addendum*.

urban growth areas.[2] They argue that they are have multiple owners or are owned by the Port of Vancouver, but response does not show they do not exist.

Consequently, the Rural Industrial Land Bank cannot be approved at this time and, therefore, a Rural Industrial Land Bank on any of the non-urban growth area sites will violate the Growth Management Act.

There is enough land in the County's UGAs to accommodate the County's planned residential and job projections

The most recent *Clark County Buildable Lands Report* documents that there is more than enough land in the County's urban growth areas (UGAs) to accommodate the County's planned employment growth. The *Clark County Buildable Lands Report* states:

> In 2014, the Board of County Commissioners chose to plan for a total of 91,200 net new jobs. The County has an estimated capacity of 101,153 jobs as follows: The 2015 VBLM [Vancouver Buildable Lands Model], indicates a capacity of 76, 978 jobs. The cities of Battle Ground, La Center, and Ridgefield, have indicated they have additional capacity to accommodate 16, 755 jobs. Publicly owned land is not included in the model, therefore we assume that the 7,400 new public sector jobs estimated by ESD [State of Washington Employment Security Department] will occur on existing publicly owned facilities.[3]

The *Clark County Rural Industrial Land Bank Responses to SEPA Comments Planning Commission Proposal*, 2-4, does not dispute that there is enough land in the urban growth areas to meet the County's planned residential and job projections.[4] Instead the response argues that the County is not required show that additional land is needed. But that was not our point. Our point is why pave over working farms when there is no need to do so? There is no dispute that there is no need for the Rural Industrial Land Bank. We recommend that the Board of County Councilors should deny this proposal.

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[2] *Clark County Rural Industrial Land Bank Responses to SEPA Comments Planning Commission Proposal* p. 4 accessed on April 4, 2016 at: https://www.clark.wa.gov/sites/all/files/the-grid/040516_19%20CC%20RILB_SEPA_Responses_Revised_Tracks_2016_0120_Marked.pdf .

[3] *Clark County Buildable Lands Report* p. 11 (June 2015) accessed on April 4, 2016 at: https://www.clark.wa.gov/sites/all/files/the-grid/061015WS_2015BUILDABLE_LANDS_REPORT.pdf and enclosed with the paper original of Futurewise's October 16, 2015 letter commenting on the *Addendum*.

[4] *Clark County Rural Industrial Land Bank Responses to SEPA Comments Planning Commission Proposal* p. 5.

The Rural Industrial Land Bank is unneeded because Commercial and Light Industrial is already located in this area

Not only is there enough land in the UGAs, but Commercial and Light Industrial land is already located west and south of the proposed Rural Industrial Land Bank. The existing Vancouver urban growth area is also just south of the site. While this proposal is being sold on the grounds that rural residents could easily drive to jobs on the new site, there are already opportunities for jobs in this area. So again, the Rural Industrial Land Bank is unneeded.

The proposed Rural Industrial Land Bank qualifies as agricultural lands of long-term commercial significance and should be conserved

The proposed Rural Industrial Land Bank is Area VB from the County's illegal 2007 attempt to dedesignate this agricultural land.[5] Area VB was found to be illegally dedesignated by both the Growth Management Hearings Board and Clark County Superior Court.[6] The "County passed an ordinance redesignating parcels BC, VB, and the portions of parcels CA–1 and RB–2 that were not purportedly annexed, as [agricultural lands of long-term commercial significance] ALLTCS."[7] So this land qualified, and as the *Addendum's* analysis shows, continues to qualify as agricultural lands of long-term commercial significance.[8] And this land continues to have an Agriculture comprehensive plan designation.[9] The enclosed Google Earth images show in that proposed Bank Industrial Land Bank, outlined in red on two of the images, continues to be farmed as are many nearby parcels.[10]

Agriculture has long-term commercial significance in Clark County. Income from farm-related sources is up sharply in Clark County, increasing from $4.2 million in 2007 to $5.98 million in 2012. This is an increase of 41 percent, a much larger percentage increase than the Washington State increase of 27 percent.[11] Between 2007 and 2013, the average market value

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[5] See *Comprehensive Growth Management Plan NE Vancouver UGA – Map 1 Deliberation Components* and *Comprehensive Growth Management Plan NE Vancouver UGA – Map 2 Deliberation Components* enclosed with the paper original of Futurewise's October 16, 2015 letter commenting on the *Addendum.*

[6] *Clark Cnty. Washington v. W. Washington Growth Mgmt. Hearings Review Bd.*, 161 Wn. App. 204, 220, 254 P.3d 862, 868 (2011) *vacated in part Clark Cnty. v. W. Washington Growth Mgmt. Hearings Review Bd.*, 177 Wn.2d 136, 298 P.3d 704 (2013). This portion of the decision was not vacated.

[7] *Id.*

[8] *Addendum* Appendix B: Agricultural Lands Analysis pages 7 – 10.

[9] County/UGA Comprehensive Plan Clark County, Washington accessed on April 4, 2016 at: https://www.clark.wa.gov/community-planning/maps

[10] See the enclosed file "RILB Vicinity Google Earth 2015 Images for Emailing.pdf."

[11] United States Department of Agriculture, National Agricultural Statistics Service, *2012 Census of Agriculture Washington State and County Data Volume 1* • Geographic Area Series • Part 47 AC-12-A-47 Chapter 2: County Level Data, Table 6. Income from Farm-Related Sources: 2012 and 2007 p. 261 (May 2014) accessed on April 4, 2016 at: http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/Washin

of products sold per farm increased five percent from $25,079 to $26,367 [12] Clark County farmers rank second in Washington State in the number of "broilers and other meat-type chickens" they are raising [13] The Clark County Food System Council reports that "in the past 5 years Clark County has seen an increase in the number of Community Supported Agriculture programs, growth in the number of farmers markets, and more interest in locally sourced and organically grown food "[14] So farming and ranching has economic benefits for Clark County

Washington State Department of Agriculture's *Washington Agriculture Strategic Plan 2020 and Beyond* documents the need to conserve existing agricultural lands to maintain the agricultural industry and the jobs and incomes the industry provides [15] As the strategic plan concludes "[t]he future of farming in Washington is heavily dependent on agriculture's ability to maintain the land resource that is currently available to it "[16] The *Addendum* discloses that this land is current available to agriculture and in fact is currently being farmed [17] Globalwise, Inc. concluded that "[o]ne of the key obstacles in Clark County is the limited access to high quality agricultural land at an affordable cost "[18] As both this letter and the *Addendum* have documented, the site of the proposed Rural Industrial Land Bank is high quality agricultural land [19]

The Rural Industrial Land Bank proposal is simply an attempted end run around the fact that this land qualifies as agricultural land of long-term commercial significance and so cannot be included in the urban growth area We urge the Board of County Councilors to deny this proposal If there was a needed to expand the UGA or provide sites outside the UGAs for major industrial developments, which there is not, there are sites that are not agricultural lands of long-term commercial significance that could be paved over

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gton/ and a copy of *2012 Census of Agriculture Washington State and County Data Volume 1* was enclosed with the paper original of Futurewise's October 16, 2015 letter commenting on the *Addendum*

[12] US Department of Agriculture National Agricultural Statistics Service, *2012 Census of Agriculture County Profile Clark County, Washington* p *1 accessed on April 4, 2016 at http //www agcensus usda gov/Publications/2012/Online_Resources/County_Profiles/Washington/cp53011 p df and enclosed with Futurewise's December 14, 2015, letter to the Clark County Planning Commission

[13] *Id*

[14] *Promoting Agricultural Food Production in Clark County*, A proposal developed by the Clark County Food System Council p 2 (November 2013) accessed on April 4, 2016 at https //www clark wa gov/sites/all/files/community-planning/Planning%20Commission/2015%20Meetings/FSCProposalDraft pdf and enclosed with enclosed with the paper original of Futurewise's October 16, 2015 letter commenting on the *Addendum*

[15] Washington State Department of Agriculture, *Washington Agriculture Strategic Plan 2020 and Beyond* pp 50 – 52 (2009) accessed on April 4, 2016 at http //agr wa gov/fof/ and enclosed with the paper original of Futurewise's October 16, 2015 letter commenting on the Addendum

[16] *Id* at p 50

[17] *Addendum Appendix B Agricultural Lands Analysis* p 37

[18] Globalwise, Inc , *Analysis of the Agricultural Economic Trends and Conditions in Clark County, Washington* Preliminary Report p 48 (Prepared for Clark County, Washington April 16, 2007) accessed on April 4, 2016 at https //www clark wa gov/sites/all/files/community-planning/Rural%20Lands/final_ag_analysis_prelim_report pdf and enclosed with the paper original of Futurewise's October 16, 2015 letter commenting on the Addendum

[19] *Addendum* Appendix B Agricultural Lands Analysis pages 7 – 10

The proposed Rural Industrial Land Bank qualifies as "Clark County's Best Farm Land" and should be conserved

The Clark County Food System Council has identified all of the proposed Rural Industrial Land Bank and much of the land in its vicinity as "Clark County's Best Farm Land."[20] The Clark County Food System Council identified this land "by looking at characteristics of the land that make it suitable for food production."[21] These included soils with land capability 1 through 4 soils, land that is flat and rolling, lands that have at least four acres outside the buffers around stream habitats, and "lands that are currently zoned for agriculture or rural residences. … [They] excluded lands that are tax exempt because they are owned by churches, land trusts, or governments."[22]

This is another reason that this land should be conserved. The Board of County Councilors should deny this proposal.

The Addendum does not identify reasonable mitigation measures and so violates the Washington State Environmental Policy Act (SEPA) and the Growth Management Act (GMA)

An environmental impact statement (EIS), including an addendum, must identify reasonable mitigation.[23] The GMA, in RCW 36.70A.365(2)(a), requires that the "[n]ew infrastructure is provided for and/or applicable impact fees are paid …" for the Rural Industrial Land Bank. But the *Addendum's* discussion of mitigation measures on page 26 of the *Addendum Part II: Alternative Sites Analysis* includes no information on how the new infrastructure will be provided or how the impact fees the county charges will be updated to include the considerable costs of the needed infrastructure. Nor are any systems development changes discussed for providing water and sewer service is not available at this site.

Similarly, RCW 36.70A.365(2)(f) requires that "[p]rovision" must be "made to mitigate adverse impacts on designated agricultural lands, forest lands, and mineral resource lands[.]" But again, the *Addendum* does not include this required mitigation. Given that these properties are agricultural lands of long-term commercial significance and are adjacent to agricultural lands of long-term commercial significance this is a significant deficiency.

The *Clark County Rural Industrial Land Bank Responses to SEPA Comments Planning Commission Proposal*, 2-5, seems to argue that the impacts on agricultural land will be migrated by a 100 foot buffer and the fact that agriculture will be an allowed use in the Rural Industrial Land

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[20] *Promoting Agricultural Food Production in Clark County*, A proposal developed by the Clark County Food System Council p. 4 (November 2013).
[21] *Id.* p. 5.
[22] *Id.*
[23] WAC 197-11-440(6)(a).

Bank [24] The buffer is required by RCW 36 70A 365(2)(i) to protect rural lands And a 100 foot wide buffer will not protect urban like uses, such as those in the Rural Industrial Land Bank, from being impacted by agricultural uses, leading to complaints that can drive farmers out of business [25] Nor is a 100 foot wide buffer sufficient to protect rural residential and agricultural uses from many industries.[26]

RCW 36 70A 365(2)(f)'s requirement to mitigate impacts on agricultural land of long-term commercial significance is a separate requirement from the buffer requirement If the land in the RILB is converted to industrial and commercial uses, what mitigation will be provided for the loss of 602 acres agricultural land of long-term commercial significance? The answer is apparently none This violates RCW 36 70A 365(2)(f)

Professor Nelson has written, "[i]t seems that for every acre of prime farmland that is urbanized, up to another acre becomes idled due to the impermanence syndrome "[27] What mitigation is proposed for this loss of the additional 602 acres of other farmland due to the impermanence syndrome? Again, the answer is apparently none Again, this violates also RCW 36 70A 365(2)(f)

The failure to identify mitigation violates both the Washington State Environmental Policy Act (SEPA) and the GMA This is other reason the Board of County Councilors should deny the Rural Industrial Land Bank

Thank you for considering our comments If you require additional information please contact me at telephone 206-343-0681 Ext 118 and email tim@futurewise org

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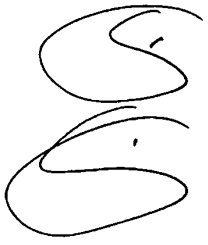
[24] *Clark County Rural Industrial Land Bank Responses to SEPA Comments Planning Commission Proposal* p 6

[25] Prepared by the Resource Lands Review Committee of the Rogue Valley Regional Problem Solving process, *Guidelines for Establishing Effective Buffers Between Rural Agricultural and Urban Uses* pp 21 – 23 (June 6, 2006) accessed on April 4, 2016 at http //rvcog org/rps_pdf/Ag_buffering_guidelines pdf and enclosed in a separate email, Department of Natural Resources, Queensland & Department of Local Government and Planning, *Queensland Planning Guidelines Separating Agricultural and Residential Land Uses* p 19 (DNRQ 97088 Aug 1997) accessed on April 4, 2016 at http //www dilgp qld gov au/resources/policy/plng-guide-sep-ag pdf and enclosed in a separate email, and Arthur C Nelson, *Preserving Prime Farmland in the Face of Urbanization Lessons from Oregon* 58 JOURNAL of the AMERICAN PLANNING ASSOCIATION 467, p 468 (1992)

[26] Western Australia Environmental Protection Authority, *Guidance for the Assessment of Environmental Factors Separation Distances between Industrial and Sensitive Land Uses No 3* (June 2005) Appendix 1 Separation Distances between Industrial and Sensitive Land Uses accessed on April 4, 2016 at http //epa wa gov au/EPADocLib/1840_GS3 pdf and enclosed in a separate email

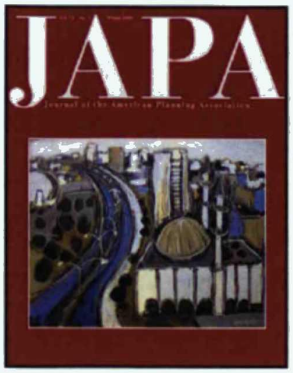
[27] Arthur C Nelson, *Preserving Prime Farmland in the Face of Urbanization Lessons from Oregon* 58 JOURNAL of the AMERICAN PLANNING ASSOCIATION 467, p 470 (1992) (citation omitted) enclosed with this letter As enclosed "Instructions for Authors" documents, the Journal of the American Planning Association is a peer reviewed scientific journal

Very Truly Yours,



Tim Trohimovich, AICP
Director of Planning & Law

Enclosures



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Preserving Prime Farmland in the Face of Urbanization: Lessons from Oregon

Arthur C. Nelson

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URL: http://dx.doi.org/10.1080/01944369208975830

Preserving Prime Farmland in the Face of Urbanization

Lessons from Oregon

Arthur C. Nelson

This article combines theory and a literature review with empirical and descriptive findings to demonstrate that Oregon's mix of policies is effective in preserving prime farmland in the face of urbanization. Exclusive farm use zones preserve farmland for farming; urban growth boundaries limit urban sprawl; exurban districts accommodate the demand for rural residential development without harming commercial farm operations; farm tax deferral and right-to-farm laws create incentives for farmers to keep farming; and comprehensive plans legitimize the entire package. This article proposes a comprehensive scheme for farmland preservation that expands on the experience of Oregon, including its mistakes.

Nelson, ASCE, AICP, has been involved in the formation, implementation, and evaluation of farmland preservation policies for twenty years. He is professor of city planning, public policy, and international affairs at Georgia Institute of Technology.

Journal of the American Planning Association, Vol. 58, No. 4, Autumn 1992.

Only a mix of policies mandated at the state level and implemented by local governments is effective in preserving resource land. Oregon's statewide land use planning program—developed over more than twenty years—exemplifies that mix. This article first reviews the reasons for farmland preservation near urban areas and then the economic impacts of urbanization on farmland. It examines the effectiveness of various farmland preservation policies. The article then describes Oregon's mixed approach to farmland preservation and offers empirical and descriptive evidence of its effectiveness. The article concludes with generalizable lessons for planning policy.

Why Preserve Farmland?

There are three general motivations for preserving prime farmland. First, prime farmland near urban areas is needed for the production of truck and specialty crops (Berry 1978; Sinclair 1967; Zeimetz et al. 1976; Volkman 1987). While some argue that there is no need to preserve farmland near urban areas because there is plenty elsewhere, only about 48 million acres of prime farmland (Soil Capability Class I and II) out of a total of about 250 million acres of cultivated prime farmland (Vining, Plaut, and Bieri 1977) are within fifty miles of the one hundred largest urbanized areas (Furuseth and Pierce 1982). Most prime farmland is located within the suburban and exurban counties of metropolitan areas (Nelson 1990b). Farmland that is most important for its location and productive qualities is also valuable for development (Solomon 1984). Urbanization of prime farmland is presently compensated for by putting lower quality, marginal land into production at greater economic and environmental cost (Platt 1985).

The second purpose of prime farmland preservation is the provision of certain public goods such as flood absorption, air cleansing, and water filtration. The third purpose is open space protection and giving spatial definition to urban areas (Rose 1984). Indeed, it is easy to conclude that the primary motivation behind farmland preservation is open-space preservation.

The Economic Effects of Urbanization on Farmland Value

Some argue that an unregulated land market would result in the most efficient use of land because property owners are best able to determine the appropriate use of their land. This is true only if owners face up to all their marginal social costs. But markets do not operate in an ideal way and so they are imperfect. The purpose of government intervention in the market is to offset many conditions causing inefficiencies (Lee 1979). Interventions can create a complex web that balances public interests with principles of efficiency. But intervention, in the form of economic incentives and disincentives, can sometimes unwittingly cause greater inefficiencies. Examples include underpriced urban facilities and highways

and tax incentives that induce people into buying larger homes on more land than they would without the inducements.

Ironically, land use regulation often aims to correct inefficiencies caused by other public policies.[1] In the absence of market intervention and given the considerable subsidies allocated to urban development relative to those to agricultural production, farmland near urban areas is likely to be overvalued for urban uses and undervalued for agricultural uses. When the land market internalizes those economic advantages into higher values, land is made more valuable for urban uses than would be the case otherwise.[2] This can lead to inefficient speculation of farmland for eventual conversion to urban development.

Undervaluation of farmland is also caused when urban development imposes spillovers on nearby farmland. Five common spillover effects are:

- Regulation of farming activities deemed to be nuisances by nonfarm residents in rural areas, including restrictions on fertilizers, manure disposal, smells, and slow-moving farm vehicles on commuter roads; limitations on use of pesticides and herbicides; restrictions on farm noises and hours of operation; restrictions on dust and glare; limitations on irrigation; and restrictions on other activities that may upset the lifestyle of suburban residents (Berry 1978).
- Increased property taxation to pay for schools, roads, services, and facilities intended to serve new residents (Keene et al. 1975).[3]
- Air pollution damage to crops caused by automobiles, industrial activity, and even residential space heating (Prestbo 1975).
- Destruction of crops or equipment or harassment of farm animals by residents of developments in rural areas, and theft of tree crops, berries, and vegetables (Berry, Leonardo, and Bieri 1976).
- Use of eminent domain to acquire at relatively low cost farmland for public uses serving primarily new residential development (Berry and Plaut 1978).

Spillovers reduce the productivity of farmland, thereby making it less valuable for farming and more attractive for speculation. The result of speculation induced by some public policies and by spillovers is that the productive use value of farmland falls the closer it is to urban and other nonfarm development (Sinclair 1967; Boal 1970; Rosser 1978; Nelson 1986a; Meier 1988).

Figure 1 traces several components of farmland value.[4] Raw land value, R_{raw}, is upward sloping to a point to account for the spillover effects that urban development has on farming. The line R_{inv} shows that the higher the investment in land, the more productive farmland is and the more valuable it is for farming. The line is upward sloping with respect to distance from urban development because of spillover effects. The line R_{farm} reflects the total value of farmland. The purpose of farmland preservation policies is to maintain, if not increase, productive value. As the raw value of farmland is fixed with respect to distance from urban development, productive value increases only by investment. Farmland preservation policies are effective only if they result in an increase in farmland investment.

Consumptive value of farmland is sometimes confused with speculative value. Consumptive value, shown as line R_{home}, is the value of farmland if it were "consumed" for nonfarm purposes (Pope 1985). No distinction is made

Urban development is contained by the regional urban growth boundary. The foreground is underutilized farmland within the shadow of urban spillovers.

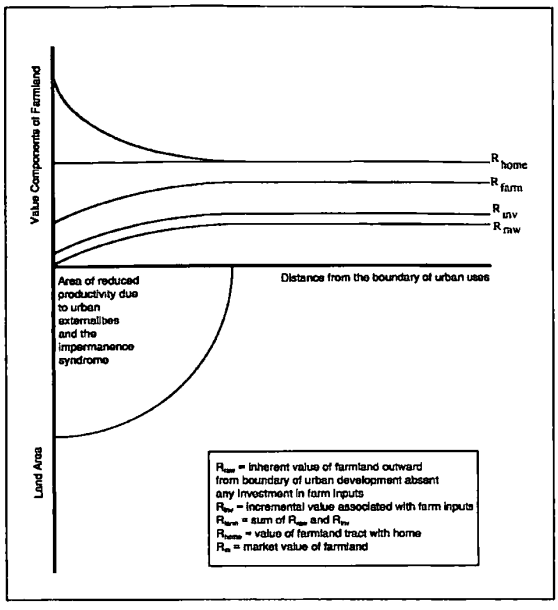


FIGURE 1: Effect of urban development on farmland value.

between the single homesite and subdivision potential values. Every farmland tract with a home has a consumptive value component. Consumptive value is the incremental value of a farmland tract as a single homesite, assuming no further partitioning of the tract can occur.

The difference between R_m and R_{farm} is speculative value. It includes a component called "inefficient speculation," which is the difference between R_m and R_{home}. It arises from distortions created by policies and market imperfections that overvalue land for urban uses and undervalue land for agriculture uses. In the absence of subsidies and urban spillovers, land is more efficiently allocated for farm and urban uses. In Figure 2, the efficient allocation of land occurs where U_1 and R_1 intersect. Land to the left of Q_1 is put to urban uses and land to the right is put to resource uses. The value of land for urban uses increases to U_2, because of subsidies for development, while the value of land for resource uses decreases to R_2 because of urban spillovers. The new equilibrium of land allocation is Q_2. Inefficient allocation of land for urban uses is the difference between Q_1 and Q_2. One aim of planning to preserve farmland in the path of urbanization is to restore the original equilibrium. To be effective, farmland preservation policies must not only eliminate inefficient speculative value, but speculative value that is efficient but for distortions. If speculative value is eliminated, farmland would remain in productive farm use.

There is one more dynamic at work that places farmland in the face of urbanization at a disadvantage. This is the "impermanence syndrome" (Keene et al. 1975; Currier 1978), characterized by the belief among farmers that agriculture in their area has limited or no future and that urbanization will absorb the farm in the not-too-distant future. It is manifested by disinvestment in farming inputs, sale of farmland tracts for hobby farm or acreage development, and shifting of crops from those requiring labor or capital intensity, such as berries and orchards, to those requiring little labor or investment, such as pasture or annual crops. The result can be vast areas of underutilized and idled land near and between urban areas (Gottmann 1961; Berry 1976; Vining, Bieri, and Strauss 1977). It seems that for every acre of prime farmland that is urbanized, up to another acre becomes idled due to the impermanence syndrome (Plaut 1976). When farmers become uncertain about the future viability of agriculture in their area, farmland production falls and so does farming income. Ultimately, the critical mass of farming production needed to sustain the local farming economy collapses (Berry 1976; Daniels and Nelson 1986; Daniels 1986; Lapping and FitzSimmons 1982). The ultimate purpose of a farmland preservation scheme, in the opinion of several researchers, is to remove the impermanence syndrome (Plaut 1976; Berry, Leonardo, Bieri 1976; Berry 1978; NALS 1981; Nelson 1984; 1986a). This occurs only when all speculation for nonfarm purposes is removed.

The Effectiveness of Common Preservation Techniques

Every state has farmland preservation policies. Effective preservation policies, however, must influence the land market in four ways. First, they must increase the productive value of farmland. Second, they must stabilize, reduce, or eliminate consumptive value (value of farmland tracts as a single homesite). Third, they must eliminate inefficient speculative value of farmland, which can happen only if speculative value attributed to urban spillovers, inefficient urban development subsidies, and undervaluation of the public goods provision of resource land, is offset. Fourth, they must eliminate the impermanence syndrome. This is accomplished when the first three objectives are met. Most farmland preservation techniques are ineffective and many have perverse effects. This section reviews why.[5]

Property Tax Relief

When farmland is assessed property taxes to pay for urban services and education mostly benefiting urban residents, farmers bear more than their equitable burden of the tax and they are pushed into developing their land prematurely (Forkenbrock and Fisher 1983). Property tax relief programs reduce the property taxes that farmers would have to pay. To prevent farmers from taking speculative advantage of those programs, most states assess a penalty equal to some of the taxes saved if the farmland tract is developed. No state requires full payback. Many charge no interest or limit the payback period from two

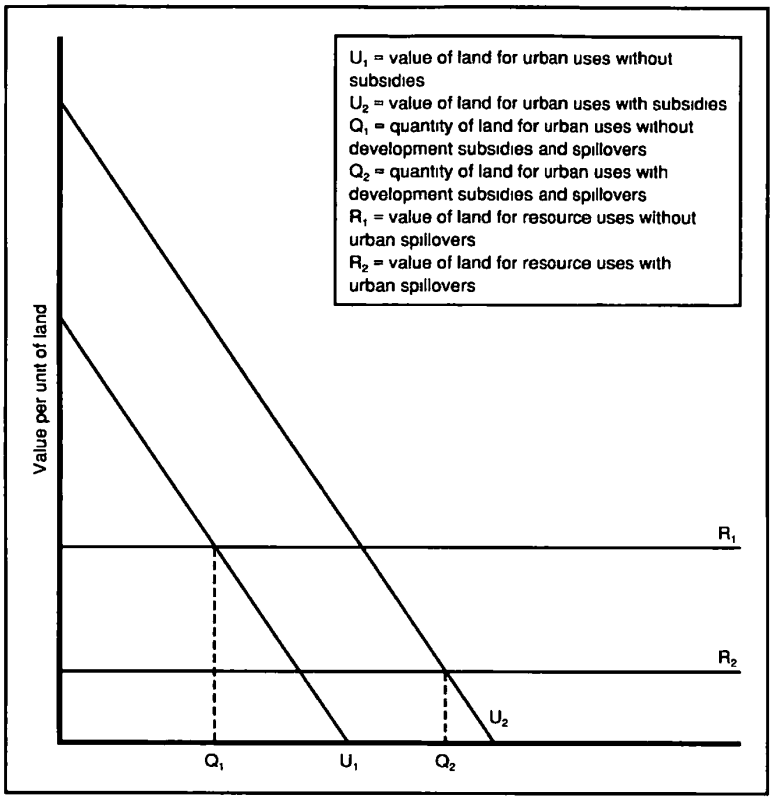


FIGURE 2: Absorption of greater agricultural land area for urban uses because of urban development subsidies and urban spillovers.

to five years. Owners of farmland actually use these programs to speculate, because they never pay 100 percent of the potential payback penalty. These programs have the tendency to induce urban sprawl.[6] In practice, all property tax relief programs create or raise speculative value by distorting land value. All extend the impermanence syndrome farther into the landscape by subsidizing the holding costs of inefficient speculation or turning farmers into speculators.

Right-to-Farm Laws

Suits and the threat of suits can threaten viable commercial farming (Hagman and Juergensmeyer 1987). Right-to-farm laws prevent urban residents from filing nuisance complaints against farmers.[7] All states have right-to-farm laws. At best, they give short-term protection to farmers at the urban-rural fringe. But a farmer could win all the legal battles in court only to lose the proverbial war to expense and wariness. Moreover, the law of trespass has so evolved as to potentially undermine right-to-farm legislation altogether (Leutwiler 1986; Bradbury 1986). The problem is that farmers and urban residents do not coexist. Right-to-farm laws are not likely to be effective in preserving farmland in the long term (Leutwiler 1986; Hagman and Juergensmeyer 1987; Lapping and Leutwiler 1987; Rose 1984; Bradbury 1986; Nelson 1990a).[8]

Acquisition of Development Rights

Some tout transfer of development rights (TDR) and purchase of development rights (PDR) programs as the most effective means of preserving farmland (Rose 1984; NALS 1981; Berry and Plaut 1978). TDR programs, which transfer development to urban areas, preserve farmland at no direct cost to taxpayers. The problem is that the owners of farmland most distant from urban areas are most likely to participate while owners of farmland closest to urban areas anticipate eventual windfalls from development and do not participate. TDR programs do not assure maintenance of the critical mass of farmland needed to sustain the long-term viability of the local farm economy (Lapping and FitzSimmons 1982). Moreover, TDR programs are randomly applied and, thus, do not prevent the scattered subdivision of farmland tracts. Yet, a regional farming economy can be so disrupted by scattered development on land not in PDR programs that it can no longer support the necessary farming infrastructure (Furuseth 1980; 1981; Furuseth and Pierce 1982;

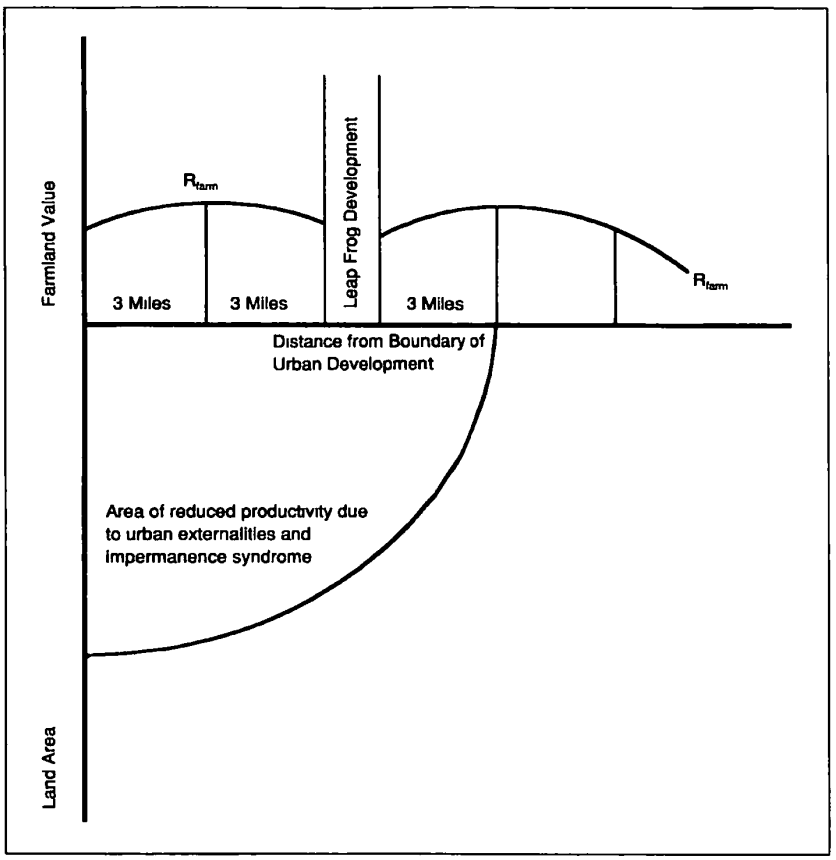


FIGURE 3: Effect of urban sprawl on the productivity of farmland and the impermanence syndrome.

Gustafson, Daniels, and Shirack 1982; Nelson 1983a; 1983b; Daniels and Nelson 1986; Daniels 1986).[9]

PDR programs involve local government purchase of development rights. Taxpayers retire general obligations bonds used to make these purchases to assure the permanent preservation of farmland.[10] Most tracts from which rights are purchased retain single homesite rights or rights in multiples of acres through minimum lot size zoning. Near urban areas, farming districts created by PDR programs can become attractive to affluent households more interested in open space and privacy than in farming (Nelson and Dueker 1989). The preservation of the critical mass of productive farmland is not assured. Moreover, taxpayers pay twice for those rights: once for the infrastructure that creates development value and again for the development value created by infrastructure. Shrewd speculators buy farmland in the path of urban development and then sell development rights at a later time. There are, thus, serious theoretical, practical, equity, and legal problems associated with PDR programs.

At their best, TDR and PDR programs are effective open space measures. At their worst, they are expensive, do not necessarily preserve the local farming economy, and can turn farmland regions into exclusive enclaves of affluent estate holders, while destroying productive farming.

Agricultural Zoning

Agricultural zoning restricts land uses to farming and other kinds of open space activity. It limits subdivision and home construction. It is sometimes used in tandem with regional urban containment planning (Nelson 1985). There are two types of agricultural zoning: nonexclusive and exclusive.

Nonexclusive agricultural zoning restricts lot sizes in agricultural areas from 1 to 160 acres.[11] The higher the density the lower the effectiveness of the minimum lot size approach to preservation. Minimum lot sizing at up to forty-acre densities merely causes rural sprawl—a more insidious form of urban sprawl.[12] However, Napa

County, California, uses 160-acre minimum lot size zoning, coupled with very strict review of building permits in agricultural areas. Perhaps low-density coupled with development review can be effective. Unless very high minimum lot size restrictions are imposed, however, nonexclusive agricultural zoning does little to prevent the development of farmland in the long term. It also does little to increase productive value, but can lead to increasing consumptive and speculative value by stimulating scattered, low-density urban sprawl into the countryside.

Figure 3 shows the effect of urban sprawl on the productivity of farmland. When development leaps over farmland or occurs along corridors bounded on either side by farmland, vastly more farmland is removed from production Regional farmland productivity declines and the impermanence syndrome is extended deep into the landscape. In this example, the impermanence syndrome would only extend three miles from the boundary of urban development were it not for leapfrog development (Nelson 1986a). Leapfrog development, however, extends the impermanence syndrome nine miles. Leapfrog and radial development can be stimulated by well-meaning farmland preservation policies that distort speculative and development behavior.

Together with property tax relief, minimum lot size zoning can result in pushing the impermanence syndrome farther into the landscape by forcing urban residents to purchase larger tracts than they want or can manage (Fuller and Mage 1975; Archer 1977; Berry, Leonardo, and Bieri 1976; Nelson 1983a; 1983b; 1986a). Voluntary agricultural districting, which combines some of the elements of tax relief programs and of nonexclusive agricultural zoning, provokes similar effects.

Exclusive farm use zoning prevents nonfarm activities in farming districts. True exclusive farm use zoning requires that farmland be devoted to commercial production. Nonetheless, exclusive farm use zoning can also extend the impermanence syndrome by forcing urban residents to purchase farms larger than they want or can manage. This is countered only when all prime farmland is made subject to exclusive farm use zoning and urban households are funneled away from areas explicitly set aside for nonexclusive farming uses.

The Oregon Approach

Oregon's statewide land use planning program is primarily intended to preserve prime farmland in the Willamette Valley, the state's most heavily urbanized area. The valley stretches one hundred miles north to south and about forty miles east to west. With only 10 percent of the state's land base, one-third of the state's entire supply of prime farmland is found there. It produces about 40 percent of the state's agricultural goods and is home to more than two million of the state's three million people. While Oregon's farmland preservation policies affect the entire state, this evaluation of policy effectiveness primarily focuses on the Willamette Valley.

Instead of relying on one principal technique, Oregon's farmland preservation policies work as a package, which includes exclusive agricultural districts, urban growth boundaries, restrictions on development of exurban districts, and, of lesser importance, farm use tax deferral and right-to-farm provisions. Comprehensive plans legitimize the entire scheme (Daniels and Nelson 1986). The result is a regulated landscape where land is explicitly allocated and restricted to specific uses (Knaap and Nelson 1992). Of the state's 61.6 million acres of land, 55 percent is publicly owned, 2 million acres are contained in urban growth boundaries, and 25.8 million acres are restricted to resource, exception, and other rural uses. Only slightly more than 3 percent of all privately owned land is set aside for hobby farming, ranchettes, or other nonresource uses outside urban growth boundaries, and another 3.3 percent is contained within urban growth boundaries. Table 1 illustrates the distribution of land use designations in Oregon.[13]

Oregon's preservation package centers on statewide planning Goal 3, which conveys Oregon's intent to preserve farmland:

> Agricultural lands shall be preserved and maintained for farm use, consistent with existing and future needs for agricultural products, forest, and open space. These lands shall be inventoried and preserved by exclusive farm use zones. . . . Conversion of rural agricultural land to urbanizable lands shall be based upon consideration of the following factors: (1) environmental, energy, social, and economic consequences, (2) demonstrated need consistent with LCDC [Land Conservation and Development Commission] goals; (3) unavailability of an alternative suitable location for the requested

TABLE 1: Distribution of land use designations in Oregon, 1986

Land use category	Acres[a]	% all land	% privately owned land
Total land area	61,587	100 00	
Publicly owned	33,750	54 80	
Privately owned	27,837	45 20	100 00
Inside UGBs	2,048	3 33	7 36
Outside UGBs	25,789	41 87	92 64
Exclusive farm use	16,036	26 04	57 61
Primary forest use	8,771	14 24	31 51
Rural residential	710	1 15	2 55
Commercial	10	0 02	0.04
Industrial	46	0 07	0 17
Rural service centers	29	0 05	0 10
Other	189	0 31	0 69

a Figures rounded to nearest 1,000 acres
Source Adapted from Department of Land Conservation and Development 1988

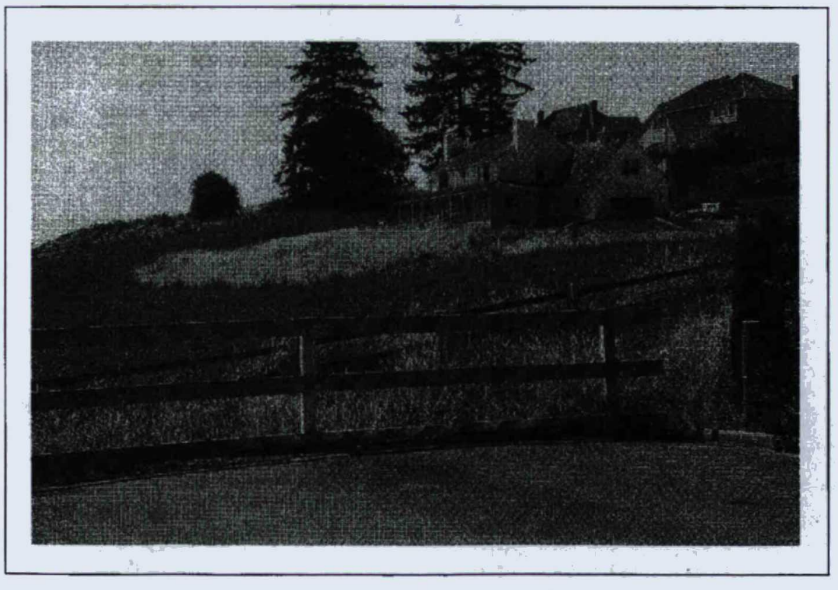
> use; (4) compatibility of the proposed use with related agricultural land; and (5) the retention of (Soil Conservation Service–determined) Class I, II, III, and IV soils in farm use. A governing body proposing to convert rural agricultural land to urbanizable land shall follow the procedures and requirements ... for goal exceptions (LCDC 1990, 5).

The policy is administered by the Land Conservation and Development Commission (LCDC), a seven member gubernatorially appointed board and its staff, the Department of Land Conservation and Development (DLCD). All prime agricultural and related land is placed in exclusive farm use (EFU) districts. This land is restricted to farm use unless the impracticability of doing so can be demonstrated in a quasi-judicial proceeding.

Preserving farmland evolved in Oregon from a minimum lot size approach to performance zoning. At first, the LCDC allowed local governments to establish minimum lot size districts to limit parcelization and home construction to large lots. Some eastern Oregon counties created 320-acre minimum lot size districts. Some western Oregon counties attempted five-acre minimums, but most settled on twenty- to forty-acre minimums. This approach, while it prohibited nonfarm uses in theory, did not clearly define acceptable uses. The approach failed largely because many counties attempted to gain the smallest minimums acceptable to LCDC. Owners divided farms and sold the parcels as hobby farms or very large suburban lots. Many critics viewed the minimum lot size restrictions as resulting in worse land use patterns, because they created rural sprawl and the loss of many times more prime farmland than would have resulted from an unrestricted land market (Archer 1977; Nelson 1983a; 1983b; 1990a; Daniels and Nelson 1986). Thus, during the 1980s, the LCDC required counties to create performance-based exclusive farm use (EFU) districts with no minimum lot sizes. Now, the only way to secure a subdivision or home construction approval on such land is to prove in a quasi-judicial setting that the change would improve agricultural production.

In theory, all land outside UGBs is preserved for resource uses. But this is impractical, because some rural land is already built on or committed to nonfarm uses and cannot be converted back to resource use. Other lands simply have soils too poor to sustain reasonable resource practices. Oregon, thus, devised an "exception" category for some rural land.[14]

Oregon's effort to preserve prime farmland is aimed primarily at preventing the occupation of those lands by hobby farmers.[15] "Rural residential areas" are used to attract hobby farmers away from prime farmland. An outgrowth of the exception process, this is an important but often overlooked component of Oregon's farmland preservation program (Gustafson, Daniels, and Shirack 1982).[16] Counties have set aside more than 300,000 acres within the Willamette Valley for rural residential—often called "exurban"—development. Statewide, more than 700,000 acres are set aside for exurban uses. Exurban districts are well suited for hobby farms since their soil is of lower quality and they are situated away from commercial farming areas.



The barricade marks the UGB. Before the boundary was finalized the road was to continue up the hill to a completed subdivision. For two years hobby farmers fought, but lost against a corrected UGB to accommodate subdivision build-out.

Empirical Evidence of Effectiveness

Is Oregon's approach effective in eliminating speculative use value, limiting consumptive use value, sustaining the critical mass of farmland needed to support the regional agricultural economy, and increasing the productive value of farmland? The regional land market can be evaluated to answer these questions (Nelson 1986a).

Urban growth boundaries, exclusive farm use restrictions, and restricted exurban development policies must effect the outcomes shown on Figure 4. First, the regional demand for land to be used for urban purposes must be shifted from rural land to areas contained within urban growth boundaries to the left of U_1 and to exurban enclaves to the right of U_2. The value of land must shift from R_m to R_p, resulting in an increase in the value of urban and exurban land, but a decrease in the value of farmland. Second, because farmland provides nearby urban and exurban land with scenery, privacy, and other benefits, there is an amenity value increment to urban and exurban land, shown as R_a from U_a to U_1 and from U_d to U_2, respectively. Third, because urban and exurban land impose spillovers, or disamenities, on farmland, resulting in reduced productivity along the urban and exurban boundaries, farmland value falls by the increment R_d from U_1 to U_b and from U_2 to U_c, respectively.

With Portland and Salem, Oregon, as the laboratories, the combination of UGBs and EFU districts indeed shifted the demand for urban land to areas inside UGBs. This resulted in higher urban values and lower farmland values (Knaap 1982; 1985; Nelson 1984; 1985; 1986a; Knaap and Nelson 1988). Exurban land values also shifted upward (Nelson 1984; 1986a; 1986b). These studies show that farmland preservation policies, in combination with urban and exurban containment policies of the sort used in Oregon, are effective in realizing the first objective of farmland preservation: shifting regional demand for urban and exurban development away from prime farmland and into targeted areas.

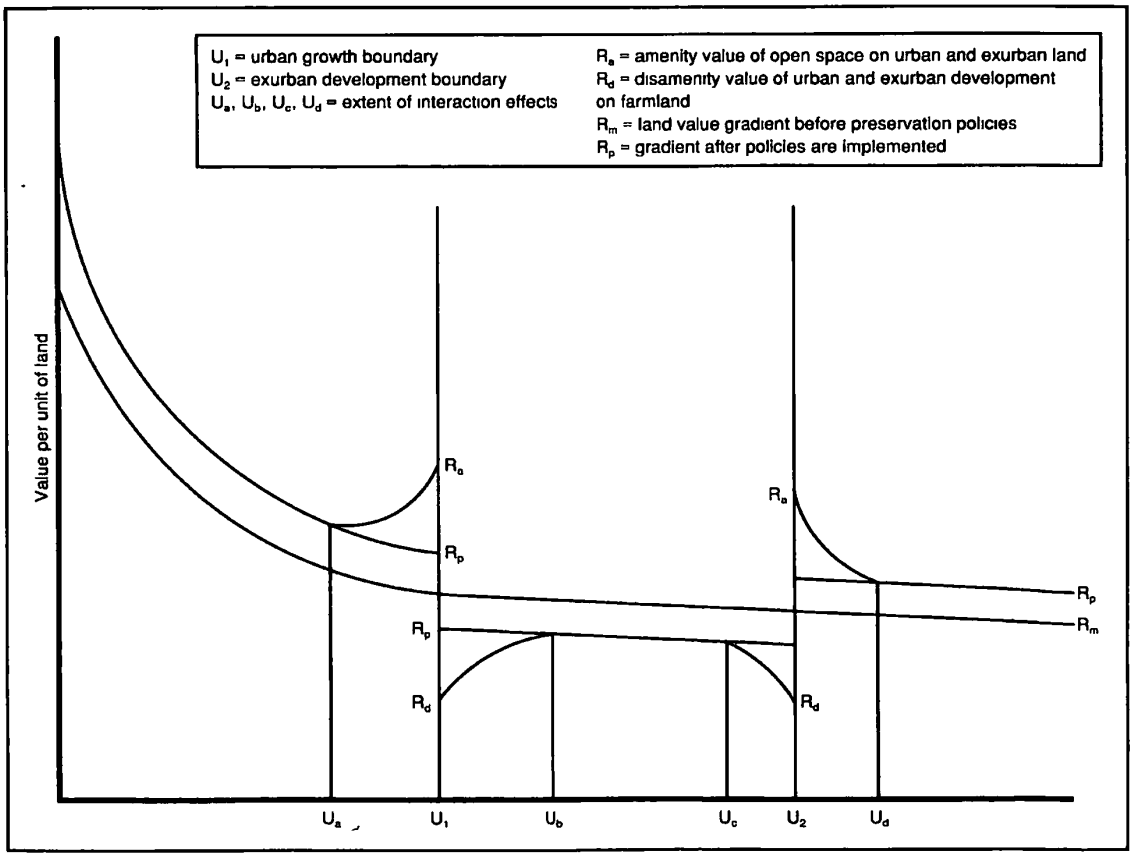


FIGURE 4: Economic objectives of farmland preservation and urban containment policies.

Second, urban and exurban land proximate to farmland must exclusively internalize quasi-public goods, such as privacy and scenery, into higher values the closer the land is to farmland (Correll, Lillydahl, and Singell 1978). The absence of this effect means that the urban and exurban land markets expect urban development of farmland in the near future. The evaluation of Salem, Oregon, shows that the value of urban land rose with proximity to the Salem UGB where that boundary separated urban development from EFU districts (Nelson 1984; 1986). This phenomenon did not occur where the UGB separated urban development from exurban districts.

The effect should also be found along the boundary separating EFU from exurban districts, as exurban households are like urban or suburban households in their pursuit of space and privacy (Davis 1990; Davis, Nelson, and Dueker 1993; Nelson 1991; Nelson and Dueker 1989; 1990). An evaluation of rural Washington County, Oregon, indicated that the value of exurban land rose with proximity to the EFU boundary (Nelson 1988).

Third, speculation of farmland for nonfarm uses, whether urban or exurban, is eliminated only when the market value of farmland falls as it nears urban and exurban land. This is because non-farmland uses will impose all the negative externalities on nearby farmland. If this effect is not detected, then the market for farmland is internalizing expectations of conversion to urban or exurban nonfarm uses.

The Salem analysis revealed that farmland value fell with proximity to the UGB (Nelson 1984; 1986). This indicates the effectiveness of the exclusive farm use restrictions in eliminating speculative use value from farmland. Farmland value seemed unaffected by urban development only three miles away from the UGB.

An analysis of the interaction between farmland and exurban land in Washington County, Oregon, used the same approach (Nelson 1988). The central question was simple: Does farmland value behave at the exurban boundary as it behaves at the urban growth boundary? The original statistical analysis revealed ambiguous interaction, suggesting no statistically meaningful effects. Perhaps exurban and farmland owners coexist principally because exurban landowners consider themselves quasi-farmers and are therefore sympathetic with commercial farming. Perhaps exurban landowners do not impose spillovers on farmland owners. But this analysis is wrong (Nelson 1990c).

A reevaluation asked at what minimum density does exurban development have no adverse influence on farmland values. Proximity to five- or ten-acre exurban districts resulted in rising farmland value, indicating that the farmland market was internalizing the expectation of conversion to exurban development. This would suggest failure of preservation policies to influence the farmland market in intended ways, resulting in the underproduction of farmland, underinvestment in that land, and emergence of the impermanence syndrome among affected farmland owners. Proximity to twenty-acre exurban districts, however, resulted in declining farmland value, indicating that speculation for conversion to twenty-acre exurban development was not evident.[17] Thus, any exurban density less than twenty acres along the exurban and farmland boundary would have undesirable effects in the farmland market.

Finally, the value of farmland in exclusive farm use districts should rise over time as the farming economy has been preserved and farming investments can be made without concern for the impermanence syndrome. While there is as yet no empirical test of this outcome, the descriptive evidence reported below seems compelling. Production is increasing and this should be associated with increasing farmland value.

Descriptive Evidence of Effectiveness

Based on the 1978 and 1982 Census of Agriculture, Daniels and Nelson (1986) concluded that Oregon's farmland preservation policies were working to preserve large blocks of farmland because of large minimum lot size zoning, but they could not determine whether agricultural production had improved or whether hobby farming and commercial farming coexisted. Instead, they found that Oregon led the nation in the formation of hobby farms between 1978 and 1982, and the future viability of commercial agriculture was in doubt.

A recent study prepared by the LCDC indicates that the preservation of prime farmland improved during the late 1980s (1989). Analysis of the period July 1985 through August 1986 and September 1987 through August 1988 indicates that new and replacement dwellings on EFU lands decreased (see Table 2). The average parcel size of new farm dwelling approvals increased: Two-thirds were on parcels greater than twenty acres in 1987 to 1988 in contrast to one-half in 1986 to 1987. New land divisions within EFU districts increased in size: In 1987 to 1988, 84 percent were larger than twenty acres in contrast to 70 percent in 1986 to 1987. Concern over nonfarm dwellings approved for EFU districts continues. Slightly less than one-half of the nonfarm dwellings were approved for the Willamette Valley and another one-quarter in southwestern Oregon. However, 84 percent of the nonfarm dwellings were approved for parcels of less than ten acres and 70 percent of the land affected was of Soil Class IV or worse. Nonfarm dwelling approvals will become more difficult in future years as the legislature, the LCDC, and special interest groups seek to contain this activity.

Recent data from the United States Department of Agriculture, in its 1987 Census of Agriculture, strongly suggests that Oregon's prime farmland preservation policies seem to work despite the continued proliferation of hobby farms. The conclusion is an important milestone for planning policy everywhere: Urban development and farming can coexist but only when certain land use planning policies are employed and strictly enforced.

TABLE 2: New dwellings on EFU lands, 1985–1988

Type of dwelling	Approved		Denied	
	1987–1988	1985–1986	1987–1988	1985–1986
New farm dwellings	205	230	9	0
Replacement farm dwellings	65	79	1	0
New farm worker dwellings	103	97	8	8
Replacement farm worker dwellings	18	21	1	1
New nonfarm dwellings	279	264	36	17
Replacement nonfarm dwellings	34	60	0	1
Total new dwellings	587	591	53	25
Total replacement dwellings	117	160	2	2

Source Department of Land Conservation and Development 1989

How Does Oregon Compare to the Northwest and the Nation?

Although there are problems with the use of the census, it is the most reliable source of longitudinal data on changes in the farming economy at the county level. The analysis here compares the performance of Oregon's agriculture with that of Washington State and the United States between 1982 and 1987. Washington State is a reasonable control, because it does not have Oregon's statewide farmland preservation mandate, but is otherwise similar (Daniels and Nelson 1986). Comparison with the U.S. can indicate strengths and weaknesses of the Oregon farming economy relative to national trends. The analysis also evaluates changes in farming performance among the nine Willamette Valley counties. The farmland policies of Oregon are not conclusively related to changes in performance relative to other states, the nation, or periods of time. The evidence presented is only circumstantial, but reasonably compelling.

Between 1982 and 1987, the entire nation lost more than 50,000 farms (see Tables 3 to 5). Oregon lost more one- to nine-acre farms proportionally than Washington or the U.S., but generally lost fewer farms proportionally above ten acres. It actually gained in the number of farms of more than five hundred acres, whereas Washington lost farms in this category. Overall, Oregon lost more smaller farms but gained more larger farms than Washington or the U.S. This is limited evidence that the preservation policies discouraged proliferation of smaller farms and preserved, if not expanded, larger farms. Unfortunately, census data do not allow analysis of what happened to those smaller farms. They may have been taken entirely out of the farmland pool (which may be undesirable) or merged to make larger units (which may be desirable).

During the same period, the nation added almost 18,000 farms reporting more than $10,000 in earnings. They can be considered *commercial* farms (Daniels 1986).[18] Oregon gained proportionately more commercial farms of 1 to 49 acres than Washington or the U.S., lost proportionately fewer commercial farms of 50 to 499 acres than the nation, and gained proportionately more

TABLE 3: Changes 1982–1987 in distribution of farms by size and total farm acreage

	Oregon			Washington			United States[a]		
	1982	1987	% change	1982	1987	% change	1982	1987	% change
Number of farms									
1–9 acres	5,987	5,476	−8 54	6,425	6,040	−5.99	181,712	177,781	−2.16
10–49 acres	12,415	11,448	−7 79	12,717	11,362	−10 66	436,886	400,989	−8 22
50–179 acres	7,662	7,219	−5 78	7,755	7,216	−6 95	704,039	637,630	−9 43
180–499 acres	3,906	3,617	−7 40	4,035	3,796	−5 92	522,660	474,677	−9 18
500 or more acres	4,117	4,254	3 33	5,155	5,145	−0 19	361,740	364,668	0 81
Total, all sizes	34,087	32,014	−6 08	36,087	33,559	−7 01	2,207,037	2,055,745	−6 85
Acreage (thousands) in farm use									
Total, all farms	17,740	17,809	0 39	16,470	16,116	−2 15	996,724	946,662	−5 02

a Figures adjusted to exclude Oregon for comparability purposes
Source U S Department of Agriculture, *1987 Census of Agriculture*

TABLE 4: Number of commercial farms and acreage in commercial farms, 1982-1987

	Oregon			Washington			United States[a]		
	1982	1987	% change	1982	1987	% change	1982	1987	% change
Number of commercial farms[b]									
1–9 acres	476	634	33 19	864	994	15 05	40,128	44,008	9 67
10–49 acres	1,767	1,891	7 02	3,100	3,072	−0.90	75,528	71,574	−5 24
50–179 acres	3,156	3,010	−4 63	3,832	3,697	−3 52	284,171	241,058	−15 17
180–499 acres	2,706	2,479	−8 39	2,982	2,760	−7 44	398,585	353,971	−11.19
500 or more acres	3,658	3,694	0 98	4,843	4,764	−1 63	334,083	340,948	2 05
Total, commercial farms	11,763	11,708	−0 47	15,621	15,287	−2 14	1,132,495	1,051,559	−7.15
Acreage (thousands) in farm use									
Total, commercial farms	15,488	15,441	−0 30	13,017	13,766	5 75	795,792	813,580	2 24

a Figures adjusted to exclude Oregon for comparability purposes
b Farms reporting $10,000 or more in annual sales, not adjusted for current dollars
Source U S Department of Agriculture, *1987 Census of Agriculture*

commercial farms of more than 500 acres than Washington. Overall, Oregon lost some commercial farm acres while Washington and the nation gained. On the other hand, the proportion of commercial farms to all farms rose faster in Oregon than in Washington, but fell across the nation.

What accounts for the considerable discrepancy in the proportion of small commercial farms in Oregon relative to Washington and the nation? Reduction of commercial farms of 180 to 499 acres may be partly explained by the rise in small farms. Farmland preservation has possibly induced an increase in commercially active hobby farms in Oregon, because settlement on small farms requires demonstration of commercial production. Has Oregon's farmland preservation program led to the division of large farms into smaller ones, or resulted in declining overall farmland production? The answer to this is based on an evaluation of the Willamette Valley, where hobby farm and land subdivision pressures are the greatest.

Performance in the Willamette Valley

Tables 6 and 7 report performance in the Willamette Valley.[19] The number of farms in the Willamette Valley fell by more than one thousand from 1982 to 1987, while the amount of farmland acreage remained nearly the same, falling by slightly more than 1 percent. The virtually unchanged farm acreage figure suggests that the farmland base stabilized over this period. Considering that in 1973 the valley lost 30,000 acres of farmland to urban uses, it would appear that farmland preservation policies caused stabilization since 1978.

Note that the number of commercial farms in the valley rose by nearly 18 percent and the farm acreage in commercial farms rose by 11 percent, or nearly 130,000 acres. The largest share of commercial farm increases occurred in the one- to nine-acre category, while the largest farm acreage gain occurred in the more than five hundred acre category. The proportion of commercial farms to all

TABLE 5: Ratio of commercial farms to all farms, 1982-1987

	Oregon			Washington			United States[a]		
	1982	1987	% change	1982	1987	% change	1982	1987	% change
1–49 acres	0 122	0 149	22 40	0 207	0 234	12 83	0 187	0 200	6 81
1–9 acres	0 080	0 116	45 62	0 134	0 165	22 38	0 221	0 248	12 09
10–49 acres	0 142	0 165	16 06	0 244	0 270	10 91	0.173	0 178	3 25
50 or more acres	0 607	0 609	0 26	0 688	0 694	0 95	0 640	0 634	−1 01
50–179 acres	0.412	0 417	1 23	0.494	0 512	3 68	0 404	0 378	−6.34
180–499 acres	0 693	0 685	−1.07	0 739	0 727	−1 62	0 763	0 746	−2 22
500 or more acres	0 889	0 868	−2.27	0 939	0 926	−1 44	0 924	0 935	1 24
All sizes	0.345	0 366	5 98	0 433	0 456	5 23	0 513	0 512	−0 31

a. Figures adjusted to exclude Oregon for comparability purposes
Note Commercial farms include those reporting $10,000 or more in annual sales, not adjusted for current dollars
Source U S Department of Agriculture, *1987 Census of Agriculture*

TABLE 6: Willamette Valley, 1982–1987, distribution of farms by farm size; farm acreage by farm size; and commercial farms by farm size

	Number and percentage change		
	1982	1987	% change
Distribution of all farms by farm size			
1–49 acres	10,986	9,900	−9 89
1–9 acres	3,721	3,256	−12 50
10–49 acres	7,265	6,644	−8 55
50–499 acres	5,076	4,674	−7 92
50–179 acres	3,579	3,301	−7 77
180–499 acres	1,497	1,373	−8 28
500 or more acres	764	791	3 53
All farms	16,826	15,365	−8 68
Distribution of farm acreage by farm size			
1–49 acres	189,129	174,745	−7 61
1–9 acres	18,913	16,315	−13 74
10–49 acres	170,216	158,430	−6 92
50–499 acres	770,047	714,556	−7 21
50–179 acres	330,066	309,182	−6 33
180–499 acres	439,981	405,374	−7 87
500 or more acres	820,547	868,490	5 84
All farms	1,779,723	1,757,791	−1 23
Distribution of commercial farms[a] by farm size			
1–49 acres	1,157	1,490	28 78
1–9 acres	242	391	61 57
10–49 acres	915	1,099	20 11
50–499 acres	2,133	2,248	5 39
50–179 acres	1,323	1,233	−6 80
180–499 acres	810	1,015	25 31
500 or more acres	644	900	39 75
Total, all farms	3,934	4,638	17 90
Total commercial farm acreage	1,196,618	1,326,453	10 85

a Farms reporting $10,000 or more in annual sales, not adjusted for current dollars

Source U S Department of Agriculture, *1987 Census of Agriculture*

farms rose substantially in all major farm size categories during this period.

There has been a general reduction in smaller farms but an increase in commercial farms in all farm size categories. Farmland owners are either taking their land out of production— thereby accounting for reductions in all but the largest of the farm size categories for all farms— or they are making their land commercially productive by merging it with other land through sale, rental, or other agreement. Overall, commercial farm production rose to $909 million in 1987 from $619 million in 1982, or nearly 50 percent. Per farm income among commercial farms rose from $157,000 in 1982 to $196,000 in 1987, or nearly 25 percent. These increases exceed the inflation rate during the period.

Table 8 compares Oregon to Washington and the nation. Oregon lost farms on a pace with the nation and Washington. It gained land in farms, however, while Washington and the nation lost land. Average farm size increased more in Oregon than in Washington and the nation. Oregon lost proportionately slightly more cultivated and irrigated farmland than Washington and the nation. Its average value per farm and per acre fell slightly more relative to Washington and the nation. Yet, its sales of farm products per farm rose at nearly twice the rates of Washington and the nation.

Earlier studies revealed no substantial differences in farming performance between Oregon and Washington, and with most national trends, between 1978 and 1982 (Daniels and Nelson 1986). Evidence now suggests the budding of divergent trends. The Willamette Valley farming economy appears more robust after full implementation of farmland preservation policies. Hobby farms and commercial farms in Oregon, especially in the Willamette Valley, are gaining in economic vitality. There has been some concern that the rise of hobby farms could result in reduced commercial farming productivity. Yet, in the valley, while the total number of smaller farms fell, the rise in productivity of commercial hobby farms (one to forty-nine acres) parallels the rise in productivity of commercial farms. This suggests that in Oregon's regulatory environment, both commercially minded hobby farmers and large-scale farmers not only coexist but mutually benefit. They may add dimensions to the farming economy and infrastructure that are mutually reinforcing. The formation of hobby farms has slowed, and some farms appear to have consolidated. Many hobby farmers have become viable commercial farming operators in their own right. It seems likely that were it not for hobby farmers and their sustenance of the economic infrastructure, the large-scale commercial farming operations might be jeopardized. Firm confirmation of this symbiotic relationship remains an open question. Also mutual coex-

TABLE 7: Willamette Valley, 1982–1987, ratio of commercial farms and acreage to all farms and acreage

	Number and percentage change		
	1982 ratio	1987 ratio	% change
Ratio of commercial[a] farms to all farms			
1–49 acres	0 105	0 151	42 91
1–9 acres	0 065	0 120	84 64
10–49 acres	0 126	0 165	31 34
50–499 acres	0 420	0 481	14 46
50–179 acres	0 370	0 374	1 05
180–499 acres	0 541	0 739	36 63
500 or more acres	0 843	1 138	34 98
Total, all farms	0 234	0 302	29 11
Ratio of total acres in commercial farms to total acres in all farms			
Total commercial farm acreage	0 672	0 755	12 35

a Farms reporting $10,000 or more in annual sales, not adjusted for current dollars

Source U S. Department of Agriculture, *1987 Census of Agriculture*

TABLE 8: Farming vitality indicators, 1982–1987, Oregon, Washington, and United States

		Oregon			Washington			United States[a]		
Indicator	Unit	1982	1987	% change	1982	1987	% change	1982	1987	% change
All farms	Number	34,087	32,014	−6 08	36,087	33,559	−7 01	2,207,037	2,055,745	−6 85
Land in farms	Acres, k	17,740	17,809	0 39	16,470	16,116	−2 15	996,724	946,662	−5.02
Average farm size	Acres	520 43	556 29	6 89	456 40	480 23	5 22	451.61	460 50	1 97
Harvested cropland	Acres, k	3,306	2,833	−14 31	5,279	4,597	−12 92	326,306	282,224	−13 51
Irrigated farmland	Acres, k	1,808	1,648	−8.85	1,638	1,519	−7 26	49,002	46,386	−5 34
Nominal value/farm	Dollars	$371,644	$299,755	−19.34	$423,352	$355,976	−15 91	$345,869	$289,387	−16 33
Nominal value/acre	Dollars	$705	$542	−23.12	$933	$739	−20 79	$784	$627	−20 03
Value, sales/farm	Dollars	$48,129	$57,664	19 81	$78,469	$87,000	10.87	$58,858	$65,165	10 72

a Figures adjusted to exclude Oregon for comparability purposes
Source U S Department of Agriculture, *1987 Census of Agriculture*

istence may not work outside Oregon. One of the underpinnings of Oregon policy is that farmland buyers must engage the land in farming, and many exurban districts have land use and development restrictions that aim to minimize potentially adverse interactions between exurban residents and farmers.

Weaknesses in Implementation

Effectiveness is always dictated by implementation. Daniels and Nelson (1986) recount how local government actions through the mid-1980s undermined state resource land preservation policies. Although recent analyses by the LCDC (1989) and the *1987 Census of Agriculture* show improvement in local government implementation, there is room for more rigor. For example, in an analysis of parcelization and dwelling unit approvals in prime agriculture and forest areas, Pacific Meridian Resources (1991) found some evidence of potentially lax enforcement of preservation policies:

- The majority of new dwellings approved in EFU areas were not being used in conjunction with commercial farm use, defined as $10,000 annual income from farming.
- Most farm operations of less than 80 acres on which new dwellings were permitted reported no farming receipts; about 90 percent of farm operations of less than 160 acres reported no farming receipts.
- More than one-half (358) of farm operations approved for new dwelling units statewide (667) were found in the Willamette Valley.
- About one-third of the forest operations that received approval for new dwellings units are not being managed for timber production.

In part because of this analysis, LCDC amended the agricultural and forest land goals in late 1992. By the late 1990s, local plans will identify and regulate "high-value" and "important" farmlands and "small-scale resource lands." High-value farmlands are suitable for commercial scale operations. Small-scale resource lands are suitable for noncommercial scale agriculture and forest operations. Important farmlands are all other rural lands, other than exception lands, suitable for some level of agricultural production. The purpose of the amendments is to put more pressure on local governments to preserve prime (high-value) farmland. Hobby farm activities would be steered into small-scale resource lands and, to a lesser extent, into important farmlands.

Toward Effective Farmland Preservation Policies

Perhaps the most important lesson from Oregon's experience is that successful farmland preservation relies on a package of techniques that reinforce each other. EFU districts preserve farmland for farming in the long run; UGBs prevent urban sprawl; exurban districts accommodate the demand for rural residential lifestyles without harming commercial farm operations; farm tax deferral and right-to-farm laws create incentives for farmers to keep farming, and comprehensive plans legitimize the entire package. This concluding section offers a regional landscape planning scheme that incorporates the best of Oregon's experiences while improving on its shortcomings.

Urban Containment

The argument that urban development ought to be contained within urban growth boundaries, urban service limits, urban stoplines, or other regulatory fixtures on the regional landscape map has been extensively and persuasively made.[20] Urban containment planning begins with estimates of future land use needs by general land use categories. Status quo trends are not simply projected into the future. The whole idea behind containment planning is achieving more efficient use of urban land: more housing units per acre, higher single-family detached dwelling densities, more flexible site planning standards allowing zero lot line and cluster opportunities, more mixed use projects and comprehensively planned communities, and higher density work environments. The

planning horizon may be set at twenty years but the UGB may have a much longer life as redevelopment and in-fill to higher densities occurs after twenty years. Such planning, however, should also include an *ultimate* UGB that establishes for perpetuity the final extent of urban development within a region.

Figure 5 illustrates the regional landscape scheme. Within the ultimate UGB there are three classes of land, each catering to a particular generation of development—the urban and urbanizable, the future urbanizable, and the urban reserve. The intermediate boundary at U_1 marks the area to accommodate immediate urban development needs. Point U_2 marks the near-term urban growth boundary, and U_3 is the ultimate growth boundary. The future urbanizable land would be expected to be developed within twenty years. The urban reserve land would accommodate very low-density uses until redeveloped to higher densities after twenty years.

Future urbanizable land would not be developed until land inside the intermediate boundary was suitably developed. This concept has been used in the urban areas of Portland, Salem, and Eugene. Minimum lot size zoning of at least ten acres would apply to the future urbanizable land to keep it in such sizes and shapes as to accommodate efficient future development.[21] Long-term facility and transportation plans would explicitly include this land. As all future urbanizable land is developed, within twenty years or so, expansion into the urban reserve lands toward the ultimate UGB would occur only if in-fill and redevelopment options failed.

The urban reserve area would contain land that Oregon now places outside the UGBs in "exception" areas. If Oregon has made any mistake in its planning it is in making its UGBs too small and in preventing adjacent or nearby exception lands from being placed within them. The LCDC required all urban areas to include within their UGBs just the amount of land needed to accommodate the urban development needs to the year 2000.[22] Many UGBs are virtually encircled by these exception lands, which are not needed for urban development and are not suitable for resource or open space activities.

These exception lands should have been included inside the UGBs to better manage their development and to improve long-term management of urban development. Under the present arrangement, because exception lands are neither urban nor resource lands, they are routinely developed for large acreage housing subdivisions, churches, convenience stores or centers, and other patently urban uses. Even though many exception lands adjacent to UGBs are subject to five-acre minimum lot size development, there is concern that it is actually easier to develop them than urban lands (Nelson 1992).

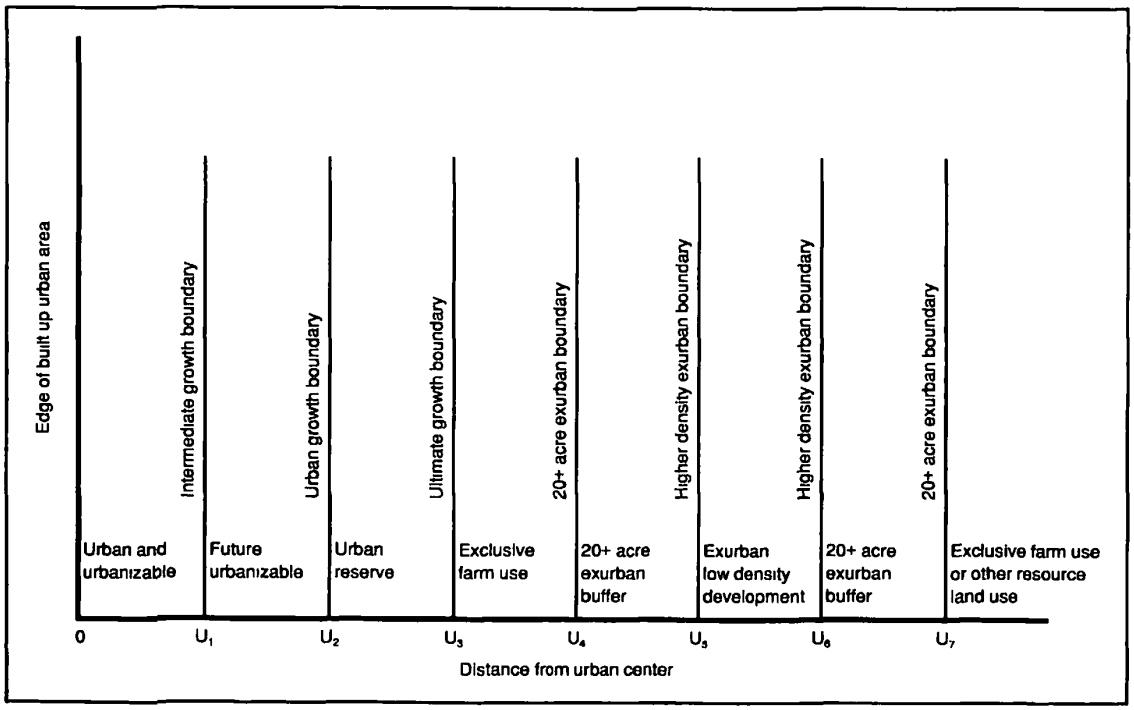


FIGURE 5: Regional planning scheme to preserve farmland.

Portland's Buddhist community could not receive a conditional use permit to build their temple in the city. Instead, they built it outside the UGB on prime farmland, as EFU zoning in Oregon allows churches as conditional uses.

What will happen when urban development under Oregon's scheme hits the twenty-year UGB? The assumption is that urban development will be accommodated through in-fill and redevelopment. But this may not take care of all needs. In some situations, the UGB must be expanded. One logical place for expansion would be the exception areas already abutting UGBs. However, by the time UGB expansion into those areas becomes necessary, they will have been developed and occupied by affluent households capable of mounting serious opposition. This is already happening (Nelson 1990b). Is UGB expansion the NIMBY of the future?[23]

A corollary mistake was that Oregon ignored the demand for hobby farms and exurban development (Nelson 1983a; 1983b; Daniels and Nelson 1986). While prospective hobby farmers or pursuers of rural living require only one to two acres, most exception areas are limited to five-, ten-, and twenty-acre minimum lot sizes. As those seeking small tracts are forced into buying larger tracts, more, not less, land is absorbed to accommodate this demand. It would have been far better for the LCDC to have allowed for the accommodation of the demand for small, one- to two-acre tracts within prescribed areas. Those areas should have been within UGBs to the maximum extent possible, and actual development of those sites should be subject to site planning restrictions requiring large setbacks—one hundred feet or more—from nearby resource lands, placement of homes to enable efficient resubdivision into single-family detached sites at some time far into the future, and prohibitions against covenants and deed restrictions that prevent future land assembly or resubdivision. Much of the legitimate demand for five- to ten-acre tracts should be accommodated in the same way.

Exurban Land Outside Urban Growth Boundaries

Even if much of the exception land could be placed inside UGBs there would remain pockets of exception land, classified as antiquated rural subdivisions, five- to ten-acre hobby farms, and twenty acre or more buffer areas.

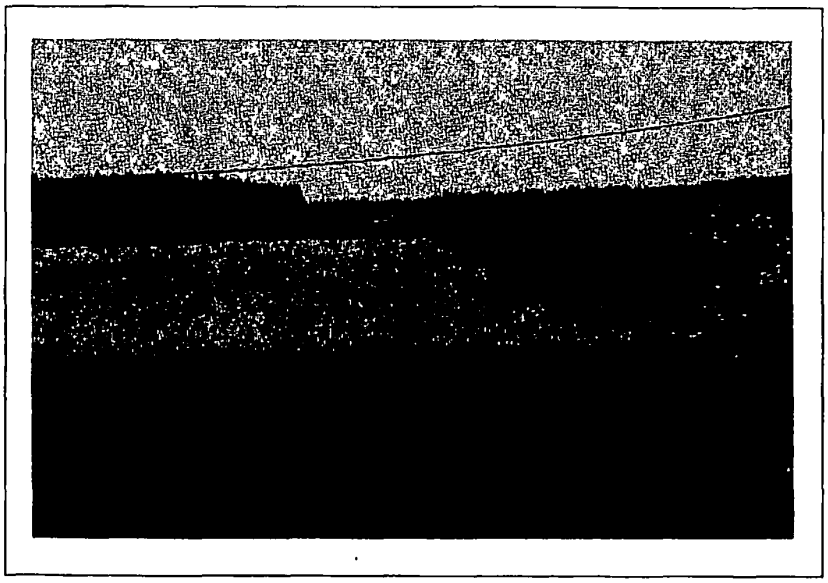
Antiquated rural subdivisions were approved prior to modern planning review. Many are already developed or committed to residential uses, but these areas can be better managed to preserve the integrity of nearby resource lands. For example, site planning restrictions should require home construction at least one hundred feet away from nearby or abutting resource lands. Owners of those sites should waive remonstrances against resource land use practices as a condition of receiving a building permit. In cases where antiquated subdivision plats are largely undeveloped but nonetheless committed, planning review should result in identifying those portions of the plat that may be reasonably used for resource or buffer activities (Nelson and Recht 1988).

Small-acre hobby farms on exception land outside the UGB should not abut EFU districts to avoid the expectation of conversion to exurban development. The exception lands abutting EFU districts should be subject to higher minimum lot sizes, of at least twenty acres. Development restrictions should be imposed to have those lands used for legitimate resource purposes as a condition of receiving building permits. In the case of forest land, the state forester could review and approve a small woodlot plan set aside by the homebuilder, where forest uses are proposed. The local county assessor could attest to the property being eligible for farm and forest use tax deferral. With these assurances the building permit could

Only a small strip of land is mowed around this hobby farm in an exception area bounded by EFU restrictions. The unmowed areas contain plants toxic to livestock.

be issued. Failure to carry out the pledge would result in zoning violations. Only in rare cases where land is clearly unusable for resource activities, such as developed or committed antiquated plots, would these requirements not apply. In all cases, home construction would also be subject to site plan review, which would require the maximum possible distance from farmland or other primary resource lands.

Where possible, twenty plus acre exurban districts would be placed between EFU and other primary resource land, and higher density exurban land or the UGB. At twenty and more acres, land can be used for a variety of resource activities, which would be required as a condition of building approval. By placing twenty plus acre tracts next to and near farmland and other primary resource districts, operators on those districts can more



A large farm adjacent to an exception area operates only two miles from the UGB. Onions are the dominant crop in this area.

easily rent the tracts for a variety of resource uses. Moreover, owners of these buffer tracts are more likely than owners of higher density exurban land to consider themselves like farmers and should be more tolerant of farming, forestry, and other resource practices.

Summary Scheme: Toward Regional Urban Form

The planning scheme divides the regional landscape beyond the ultimate urban growth boundary into twenty plus acre minimum lot size exurban districts buffering EFU lands from small acreage exurban districts. Regardless of regional urban development pressures, the ultimate UGB would remain fixed to preserve farmland and other resource lands. The twenty plus acre exurban buffer districts would also remain fixed, although low-density urban-type development could possibly invade selected exurban districts. The ideal regional urban form is achieved through regional landscape planning that includes the creation and rigid enforcement of development boundaries supplemented by rigidly enforced land use restrictions on exurban and resource land.

Figure 6, which combines elements of Figures 4 and 5, shows what the regional economic landscape must look like. If these relationships are not observed, farmland preservation policies may not be effective and perverse outcomes may be at work. Failure may be caused by uniquely local circumstances that require refinement of the scheme. Failure may also be attributable to lax enforcement in issuing development approvals.

First, the regional landscape planning scheme must affect the regional land market in predictable ways. The regional demand for urban land must be shifted from the regional landscape to areas inside the UGB. Actually, the near-term regional demand should be entirely shifted to the area within the intermediate growth boundary and the long-term demand should be shifted to the area between the intermediate and the twenty-year UGB. The regional demand for exurban land uses should be shifted principally from all rural land to areas either between the twenty-year and ultimate UGBs or within exurban districts located outside UGBs.

Second, there should be no interaction of land value along the intermediate growth boundary. Owners of urban land just inside and owners just outside the intermediate boundary should expect the boundary to be moved outward and urban development to occur in the new space in the near future. Similarly, there should be no interaction effect between land just inside and outside the twenty-year UGB.

Along the ultimate UGB there should be interaction effects. Land just inside the ultimate UGB should rise in value the closer it is to the UGB, because it should capitalize the quasi-public goods or benefits that it exclusively enjoys. Just outside the ultimate UGB, farmland or other resource land value should fall the closer it gets

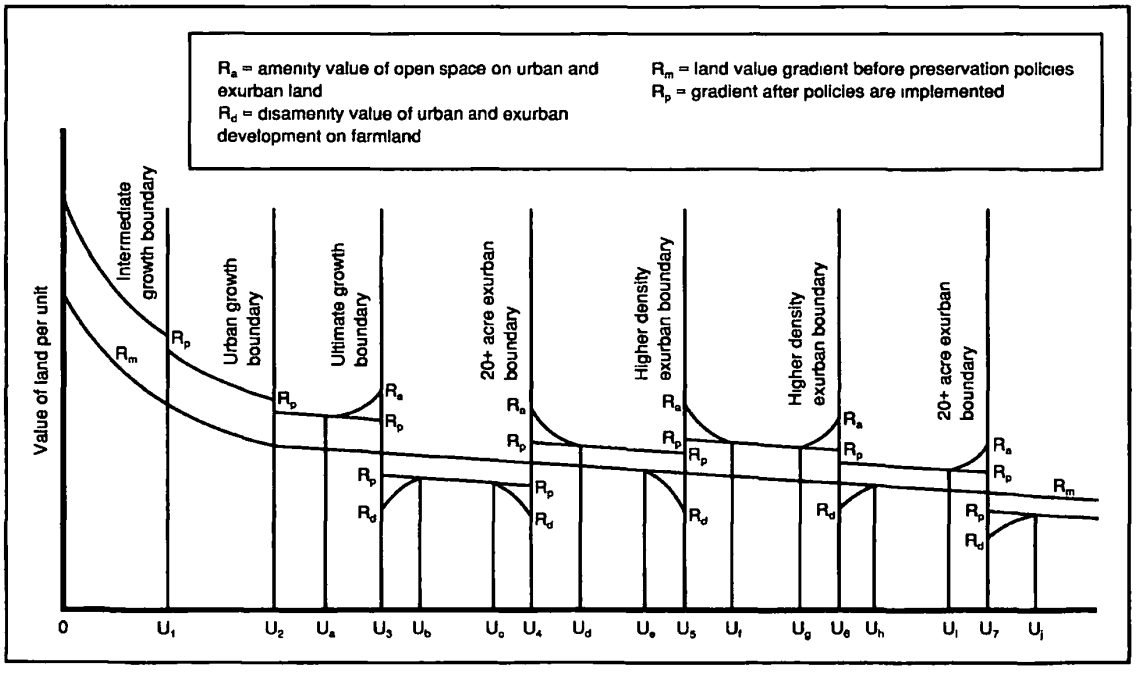


FIGURE 6: Regional economic landscape that preserves farmland in the face of urbanization.

to the UGB, because urban spillover effects dampen productivity and therefore reduce the value of this land for resource production. It is possible that these effects would not be detected until exurban or urban development came to the UGB.

Along the boundary separating farmland and the exurban twenty acre plus buffer districts there should be similar effects. Through site development review home and work structures could be so removed from the boundary that they would not necessarily impose spillovers on farmers. If home construction in this district required putting land into resource activities and waiving remonstrances against farming activities, spillovers could be prevented. Farmers could lease these tracts for farm use. Avoiding the internalization of spillovers is a desirable outcome that is limited to twenty plus acre exurban buffer districts. In any event, the value of the exurban buffer land would rise the closer it gets to farmland, because it will exclusively enjoy the quasi-public goods and benefits of farmland proximity. However, public policy must be firm in maintaining the integrity of the exurban buffer district to avoid undesirable interactions between owners of those tracts and farmers.

Along the boundary separating the exurban twenty plus acre buffer districts from higher density exurban districts, the interactions are much more fluid and problematic, even ambiguous. If public policy is firm in maintaining the integrity of the twenty acre plus buffer districts, the value of the buffer land will fall the closer it gets to higher density exurban districts because of spillovers. On the other side of the boundary, the value of higher density exurban land would rise the closer it is to the exurban buffer districts because it should capitalize the quasi-public benefits that those districts offer. This is the desirable interactive outcome. Undesirable outcomes would be revealed if exurban buffer land values increased closer to the boundary, reflecting expectations by landowners of conversion to higher density exurban uses.

Cultivating the Preservation Hybrid

Fully effective farmland preservation policies have eluded local and state governments. Many have unwittingly accelerated the conversion of farming districts to hobby farms or low-density urban subdivisions. There is evidence that urban land is overvalued through government development subsidies, inefficient utility provision, and other market distortions induced by policy and inherent market imperfections. Farmland is undervalued for the same reasons and because of urban spillovers. In result, vastly more farmland is removed from production than should occur. Moreover, just a small reduction in farmland productivity can undermine the critical mass of farming infrastructure needed to sustain viable operations in a region. Perhaps, as Daniels (1990) observes, the best way to preserve farmland is to generate greater income for farmers. Sweden guarantees prices for farmers so they can outbid urban developers for the best farmland (Lapping 1979). Sweden also employs sophisticated new town and urban expansion planning. But the U.S. lacks a clear national policy toward the preservation of prime farmland, especially in the face of urbanization, and, therefore, state and local governments are left to their own devices to protect their long-term interests in farmland.

State and local governments are limited in their economic and legal capabilities. They cannot alter food prices. They cannot interfere with federal policies that raise or lower commodity supports. They cannot afford the purchase of the development rights of farmland—nor should they. The most effective farmland preservation tools available to state and local governments are land use planning and development regulation. The most effective mix are those used by Oregon plus the modifications proposed here.

NOTES

1. See Brown and Roberts (1978) on the role of local, state, and federal policies in stimulating inefficient land owner behavior and, implicitly, the need for land use regulatory mechanisms to compensate for these inefficiencies. See also Harvey and Clark (1965), Clawson (1962), and Nelson (1990a).
2. It is not known the extent to which farm subsidy policies offset urban subsidies. While total federal government commodity support policies totaled less than $20 billion in 1989, federally backed mortgage loans issued in 1989 exceeded $150 billion. According to the *1991 Statistical Abstract of the United States*, more federally backed home loans were delinquent in 1989 than all commodity price support policies in 1989 combined.
3. Farmers pay for those new facilities and services on the basis of land value, but not on whether they use them.
4. This figure is adapted from Nelson 1986a, 1990a.
5. For an extensive review of all common farmland preservation techniques see Nelson (1990a), a reply by Daniels (1990), and a rejoinder (Nelson 1990c).
6. Some farmers who enroll in those programs produce less than farmers who do not. While farmers realize a reduction in the cost of operations and this raises net revenues, it does not pressure them into making their land more productive (Bahl 1968; Goldberg and Chinloy 1984; Mills and Hamilton 1988). When urban development leapfrogs over farmland enrolled in a property tax relief program, the volume of land made underproductive increases.
7. Most right-to-farm laws also limit the ability of public agencies to condemn farmland for public works projects that can adversely affect the viability of farming districts.
8. At the heart of right-to-work laws is the desire to protect innocent farmers from land use actions or restrictions over which they have little or no control (Leutwiler 1986). These laws make it difficult for

nearby nonfarm residents to restrict operations through nuisance suits. There are many shortcomings, however. Right-to-farm laws do not prevent farmers from converting their land to an urban use or prevent the sale to speculators; may not apply to the operations of new owners; and do not protect changes in agricultural practices (Lapping and Leutwiler 1987). Farmland that is fallow during the year in which new development occurs nearby may not be protected when actively farmed.

9. If these programs can succeed in protecting a critical mass of land, they can help sustain the agricultural infrastructure. In Montgomery County, Maryland, for example, the TDR program may have transferred sufficient development rights from large areas considerable distances to create the necessary critical mass to sustain agriculture into the long-term future.
10. PDR programs, because they are voluntary, suffer from the same limitations as TDR programs. They do not assure preservation of prime farmland in quantities and in locations suitable to sustain a viable agricultural economy. Nonparticipants remain free to farm or subdivide their land.
11. Incredibly, some farmers in Florida claim that one-acre minimum lot size zoning is perfectly acceptable in farming districts. They argue that higher minimum lot size zoning reduces land value, which reduces the amount they can borrow for agricultural purposes. The argument is specious. Farm loans do not exceed more than a certain percentage of the value of land for agricultural purposes. Moreover, with one-acre zoning, large-lot residential subdividing could not be prevented. Ironically, some farmers say they will volunteer not to subdivide and develop in return for the zoning. This promise would be difficult to enforce at best. Would a foreclosing lender be prevented from subdividing? Studies show that restrictive farm use zoning has not prevented farmers from securing agricultural loans in the amounts they would have received anyway (Coughlin 1984).
12. Nonexclusive agricultural zoning usually includes large minimum lot sizes; entitlement to single-family home construction on any preexisting and newly created but conforming lot; no requirement to demonstrate the effects on farm production of land partitioning at the minimum lot size; and conditional use permits allowing commercial recreation, smaller than minimum lot size developments, patently nonfarm dwelling units, agriculturally related industrial activities, and planned developments sometimes at higher densities.
13. The distribution has changed slightly since 1986 through continual fine tuning and plan revisions required by Oregon planning law.
14. The original criteria for determining whether land qualified for exception status were difficult to meet and carried a heavy burden of judicial review. Consequently, most plans failed to meet LCDC approval. Acceding to legislative demands, the LCDC replaced the original test with the impracticability test, which allows more flexibility in classifying rural land for exception status. One result has been a scattered and pervasive pattern of exception lands throughout the state.
15. Lapping (1980), Healy and Short (1981), and Buttel (1982) observe that hobby farmers often purchase more land than they are able to put to productive use; are generally unwilling or unable to make the investment in farm equipment and labor necessary to produce a commercial volume of farm products; compete with commercial farms for the same land, causing fragmentation of land holdings, driving land prices upward beyond what can be paid for out of a farm income; are a source of vandalism on nearby commercial operations and a cause of legal attempts to limit commercial farming practices; and create in commercial farmers questions of the future viability of farming, making them less willing to undertake long-term investments. As commercial farmers go out of business, an area can lose the "critical mass" of farms and farmers needed to maintain agricultural support services.
16. The framers of Oregon's farmland preservation program did not anticipate the magnitude of the demand for hobby farms. Between 1978 and 1982, Oregon led the nation in the formation of hobby farms and many analysts expressed concern that the trend would undermine Oregon's farmland preservation policies (Nelson 1983a; 1983b; Daniels and Nelson 1986; Daniels 1986).
17. The finding also indicates that even at twenty-acre minimum lot size restrictions, exurban development can be expected to impose negative spillovers onto farmland. The question now becomes: At what minimum density should we expect no statistically meaningful impacts of exurban development on farmland value? Would it be forty acres? Eighty acres?
18. Census tabulations do not adjust for inflation.
19. Willamette Valley includes Benton, Clackamas, Lane, Linn, Marion, Multnomah, Polk, Washington, and Yamhill counties.
20. Proper urban containment planning results in public facility and service savings (Nelson and Knaap 1987; Nelson 1987); improved delivery of social services; more efficient transportation systems (Newman and Kenworthy 1989); improved interaction among economic activities; lower housing package costs, although with possibly higher density and lower housing space (Real Estate Research Corporation 1974; Frank 1989); lower energy costs (Keyes and Peterson 1977); more efficient government management, assuming flexible management schemes such as interlocal cooperative agreements (Nelson 1991b); improved interaction between social classes (Jacobs 1961); improved sense of place (Lynch 1983); and, of course, preservation of open spaces outside urban development for farming, forestry, recreation, flood

control, air cleansing, watershed, and related purposes.

21. Alas, all urban areas allow subdivision of future urbanizable land into one- to two-acre tracts. Although subdivision plans must include homesite locations that theoretically enable wise redivision in later years, the practical effect is to condemn future development in these areas to hodgepodge in-fill that residents are likely to oppose.
22. Some larger urban areas received approval for more land inside UGBs than strictly needed for development, arguing that more land was needed to prevent monopolistic behavior among landowners and to provide adequate locational choices for developers. The Portland UGB contained 15.8 percent more land than strictly needed and Salem's UGB contained 25 percent more than needed.
23. In mid-1992, the LCDC adopted the "urban reserve" rule, which would effect a few of the points argued in this article. By the mid-1990s, seven urban areas, including metropolitan Portland, will identify areas for UGB expansion, mostly on exception lands but also on selected prime farm and forest lands. Although not to be included in the UGB initially, lands placed into the urban reserve would be managed in such a way as to make urban expansion more efficient. In effect, this rule creates a longer term UGB, somewhat akin to the ultimate UGB proposed here.

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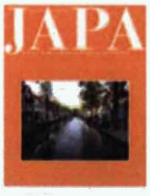

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Schroader, Kathy

From: Cnty Board of County Councilors General Delivery
Sent: Tuesday, April 05, 2016 7 33 AM
To: Mielke, Tom; Madore, David, Stewart, Jeanne, Olson, Julie (Councilor), Boldt, Marc
Cc: McCauley, Mark, Tilton, Rebecca, Schroader, Kathy
Subject: FW Comments for County Council RILB public hearing April 5
Attachments: Ag_buffering_guidelines pdf; plng-guide-sep-ag pdf

more for the record

From: Tim Trohimovich [mailto:Tim@futurewise.org]
Sent: Monday, April 04, 2016 3:46 PM
To: Cnty Board of County Councilors General Delivery; Cnty 2016 Comp Plan
Subject: RE: Comments for County Council RILB public hearing April 5

Dear Sirs and Madams

Here is two of the enclosures referenced in our letter

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From: Tim Trohimovich
Sent: Monday, April 04, 2016 3 41 PM
To: 'boardcom@clark.wa gov' <boardcom@clark wa gov>; 'comp.plan@clark.wa.gov' <comp.plan@clark.wa.gov>
Subject: Comments for County Council RILB public hearing April 5

Dear Sirs and Madams

Enclosed please find our comment letter for the April 5, Rural Industrial Land Bank public hearing It also includes two of the enclosures We are sending other enclosures in two separate emails Thank you for considering our comments.

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Guidelines for Establishing Effective Buffers Between Rural Agricultural and Urban Uses

(June 6, 2006)

Prepared by the
Resource Lands Review Committee (RLRC)
of the
Rogue Valley Regional Problem Solving process

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Guidelines For Establishing Effective Buffers Between Rural Agricultural and Urban Uses

I – INTRODUCTION

Good quality rural agricultural land is a finite and steadily shrinking state and regional resource that must be conserved and managed for the long term A crucial element of Oregon=s Statewide Planning Goals and Guidelines, developed out of Senate Bill 10 in 1969, is to "preserve and maintain rural agricultural lands@(Goal 3) The Oregon Legislature subsequently adopted policies (ORS 215 243 and 215 700) to further define how to preserve "the maximum amount of the limited supply of rural agricultural land@and the Department of Land Conservation and Development has developed numerous Administrative Rules in further support Current state policies and law overwhelmingly mirror public opinion concerning rural agricultural land, with the most common reasons for preserving farmland having to do with its significant role in diversifying the regional economy, the important contribution it makes to the area=s quality of life and culture, its ability to provide wildlife corridors, the protection it can provide to riparian areas, and even the temporizing effect it can have on the local microclimate

One unintended consequence of the clear demarcation between rural and urban uses created by the statewide land use system in Oregon is the conflict often created by the sharpness of the transition from many urban uses to farming practices Chemical spray drift, noise, dust, odor, and chemical run-off from the rural agricultural side affect new urban residents, and sediment, stormwater run-off, residential chemical spray drift, trespass, and vandalism impact the rural agricultural side The closer the two uses are to each other, the more dramatic and long-term the problems are likely to be

The most effective means of lessening the potential for conflict is separating the two uses Although there are a variety of ways in which to achieve this separation, the most elemental is distance The greater the distance, the greater the buffering effect Unfortunately, land is at a premium in the Rogue Valley, and buffer areas that are practical for this relatively narrow and densely populated valley will not totally eliminate all impacts of rural agricultural activities This region does not have the luxury of setting aside 1,000 feet or more of buildable urban land to mitigate potential conflicts between urban and rural uses The education of residents and farm operators, the employment of deed restrictions, siting requirements, construction standards, fencing, minimal separation distances, vegetative elements, and the use of best farming practices, including systems of spray notifications, are all useful mechanisms in avoiding as much conflict as possible.

II – PURPOSE

The purpose of establishing a regionally applicable set of guidelines for buffering urban development from rural agricultural lands is to provide consistent technical guidance on reducing the potential for conflict between farming activities and urban uses (principally residential and institutional development) This purpose is in accordance with the Planning Guidelines of Statewide Planning Goal 3 (Agricultural Lands), which states that urban growth should be separated from rural agricultural lands by buffer or transitional areas of open space The guidelines in this document are intended to assist local governments, developers, landholders, and consultants in arriving at the best buffering solution for urbanizing areas in juxtaposition to rural agricultural land

III – OBJECTIVES

These buffering guidelines seek to achieve the following objectives

1 To ensure the continued use of farmland for farm uses

2 To minimize potential conflict by developing, where possible, a well-defined boundary between rural agricultural and urban uses The best boundary will be one that provides a sound transition in both directions, from rural to urban and urban to rural

3 To minimize the impacts of urban development on rural agricultural production activities and land resources

4 To minimize the potential for complaints about rural agricultural activities from urbanized areas

IV – WORKING PRINCIPLES

The buffering guidelines herein have been developed around the following considerations

1. Adequate consideration of potential conflict between existing rural agricultural zoned lands and proposed urban levels of development is necessary during development assessment **Significant conflict is assumed to be likely in all cases where urbanization is proposed within 500 feet of Class I - IV rural agricultural land. In addition, some lesser level of conflict is assumed possible within the next 500 feet from the urban/ rural boundary.** Agricultural buffers that are appropriate to the realities of the region will not be successful in completely negating these potential conflicts, but can lessen their severity, frequency, and negative impact on both agriculture and urban quality of life

2 Those individuals seeking to buy, rent, or lease urban properties within 1,000 of rural agricultural land should be informed in writing of the consequences of being located within a "rural agricultural impact zone "

3 Local or regional long-range planning should avoid, as far as is practicable, locating urban sensitive receptors, primarily residential development, in proximity to rural agricultural land Where urban sensitive receptors must be located near rural agricultural land, buffering mechanisms should be used to minimize potential conflicts

4 The central concept in buffering is adequate separation between conflicting uses There are a number of strategies for achieving this separation through planning decisions and the use of planning controls

- A well-designed vegetative buffering element will reduce the amount of land required for an effective buffer
- Man-made or natural features should be incorporated in buffers whenever possible, such as infrastructure rights-of-way, roads, non-residential structures, watercourses, wetlands, ridge lines, rock outcrops, forested areas, and steep slopes
- A buffer area can provide public open spaces or purpose-designed buffer areas (public recreational/natural areas) if the location is appropriate for satisfying a portion of the community's open space needs, the use of the buffer area as public open space is compatible with adjoining uses, the buffer area is not the community's principle provider of recreational opportunities, and the impacts from the adjoining rural agricultural use do not overly restrict the planned recreational use of the open space
- Existing areas of rural residential zoning can provide the required buffering if and when the rural residential lots provide a minimum of 200 ft of separation between the urbanizing and rural agricultural land
- Existing small-acreage farms (5 acres or less) can provide the required buffering if and when the small acreage farms provide at least 200 ft of separation between the nearest farmable land (including animal enclosures) on the small-acreage farm land and the nearest planned urban sensitive receptor The owners of these small-acreage farms must agree to the use of their property as a buffering mechanism

- ♦ There is a publicly owned right of way that could be incorporated as part of the buffer

5. It is unreasonable for new urban uses to require a modification of rural agricultural activities practiced according to recognized industry standards, especially if those modifications would hamper efficient rural agricultural operations The existing use has precedence

6 Buffering mechanisms should be provided/funded by the proponent of the urban development The buffering mechanisms will be physically located entirely on the ubanizing property, unless

- ♦ there is a publicly owned right of way that could be incorporated as part of the buffer,
- ♦ there is a naturally occurring area on the rural agricultural land that is permanently incapable of being farmed (rock formation, riparian area, etc), is of sufficient depth, and is contiguous with the border of the urbanizing land or a publicly owned right of way,
- ♦ the proponent of development purchases from the farm owner an easement on agricultural land of the appropriate length and depth, and pays for the establishment of whatever vegetative buffer, fencing, or irrigation system that would have been required on the urbanizing land, or
- ♦ title to the area providing the physical portion of the buffer is transferred to the farm being buffered If a vegetative buffer is indicated, it is installed by the developer Whether a vegetative buffer is installed or not, the buffer is henceforth the responsibility of the farmer, and must be maintained as a buffer as long as the property remains zoned for resource use

7 The buffering mechanisms must be included in the development application and must be approved by the city **before or concurrent with** final approval for the development project

8 The city is responsible for enforcing compliance with all matters pertaining to the implementation of planned and approved buffering plans The city shall permit developers flexibility in scheduling the establishment of the approved buffering mechanisms due to factors such as water availability, weather, and general logistics, although the buffer plan shall establish a sequencing of buffer mechanism implementation that demonstrates completion prior to either final plat sign off or final building inspection (for larger lot buffers and in the event no land division occurs)

9 Although flexibility in the nature and design of buffering mechanisms can be provided for in the event of significant localized circumstances, customized (flexed) buffer designs must be at least as effective as the buffering options established herein Proposed flexed buffer designs must be clearly justified, with the burden of proof being on the proponent of urban development to show that the flexed buffer design will not reduce the intended level of protection

10 Class I – IV rural agricultural land is presumed to be of "high potential impact" due to the fact that it can be and often is used for a wide variety of different rural agricultural uses, and because new and as yet unforeseen uses and practices are likely to surface in the future Therefore, these rural agricultural lands are assumed to require buffering mechanisms that mitigate the most likely high impact rural agricultural land use, regardless of present use The only exception to this would be those class I – IV rural agricultural lands that have a long and essentially unbroken history of rural agricultural inactivity or grazing use These, as well as all Class VI rural agricultural lands, would be considered of "low potential impact" (see Element A - Chemical Spray Drift)

11 To mitigate a reduction of overall residential densities resulting from urban land dedicated to buffering mechanisms, a city shall permit the proponent of urban development to maintain planned densities through lot size averaging, clustering, planned development criteria, or similar techniques The objective is to maintain minimum density across the development

12 Where conflicts already exist between rural agricultural and urban land uses, mechanisms including mediation, source controls, and public outreach are encouraged

V – APPLI CABI LI TY OF THE GUI DELI NES

Although these buffering guidelines were developed to be applied to urbanizing lands originally selected as urban reserve lands identified through the Regional Problem Solving process "NOW X 2", they can also be applied to future urban growth boundary expansions into non-urban reserve lands, should

changing conditions cause that to occur

These guidelines can also be used by cities to buffer urban development occurring within already established urban growth boundaries from rural agricultural land outside the UGB (whether that rural land part of or not part of an Urban Reserve Area). The single greatest potential difficulty in applying these guidelines (which are generally more comprehensive than those presently in force in the region's cities) within existing UGBs is the possibility that there are single lots on the urbanizing side, not part of a larger development and less than 300 ft in depth, which could suffer disproportionately from the economic impacts of the buffer requirements In those cases, depending on the width of the lot, a proportionate buffering distance should be determined Jackson County's **Alternative Setback Reduction Rules** (Jackson County 2004 Land Development Code chapter 8, Section 8 5 3(F)) provide an example of how such a proportionate distance could be calculated An alternate means of buffering these relatively shallow parcels could be the use of a scaled-back bamboo-based vegetative buffer reduced to a minimum of 30' in width (a single rather than double row of bamboo spaced 10 ft apart at planting), with an additional 5' width for a climb-resistant fence Flexibility of this type is only permissible when applied to parcels within UGBs established prior to January 1, 2006.

VI – BUFFER LONGEVI TY

Depending on the location of the urbanization, whether it borders rural agricultural land that is either outside of the UGB but within an Urban Reserve, or wholly outside of an Urban Reserve, buffering mechanisms can be expected to have a shorter or longer useful life. There are two categories of buffers based solely on their projected longevities – **long-term and mid-term** buffers

Long-term Buffer Buffers providing protection to rural agricultural lands outside of Urban Reserve Areas The rural agricultural lands being buffered are resource lands not identified for future urbanization in any state-recognized plan, either regional or municipal

Mid-term Buffer: Buffers providing protection to rural agricultural lands within a city's Urban Reserve Area

Long-term and mid-term buffers are closely related in their requirements, and both must be designed to preserve longer-term functionality Nonetheless, because the rural agricultural land being protected by mid-term buffers is destined for conversion to urban uses within a distinct planning horizon, albeit a relatively long one, mid-term buffers must be designed for eventual conversion to urban uses The specific buffering mechanism used in a mid-term buffer will depend on a number of factors what is the most likely time period it will remain as a buffer, what are the important financial considerations affecting the proponent of development, and to what specific use will the buffer eventually be put once the rural agricultural land is urbanized – will the physical buffer eventually be converted to housing or to roads, or will it be used to provide a recreational use for the community?

For some mid-term buffers, **the simplest yet most effective solution to providing the buffer may be to defer the development of an appropriate portion of the urbanizing land bordering rural agricultural land until such time as that rural agricultural land is made urbanizable through its eventual incorporation into the UGB and subsequent annexation.**

VI I – MAJOR BUFFERI NG ELEMENTS

For the purposes of providing options for addressing the major potential sources of conflict between rural agricultural and urban lands, these sources of conflict have been grouped as follows

Chemical Spray Drift – Principally directed at mitigating rural agricultural chemical use, but can also be effective in protecting agricultural production from careless homeowner use of agrochemicals Separation between urban and rural agricultural uses is the preferred tool,

employing either simple distance or a combination of distance and a vegetative buffer

Noise – Noise is an impact arising from rural agricultural operations A reasonable level of mitigation can be achieved through community design and construction standards for individual structures

Sediment and Stormwater Run-off – These impacts arise from both the urban and agricultural sides, and can severely impact rural agricultural operations as well as urban health and livability These negative impacts can be avoided or significantly reduced by appropriate erosion prevention and control measures during construction, and by an adequate stormwater master plan for the development that takes into account impacts from and on the adjoining rural agricultural land

Trespass and Vandalism – Trespass and vandalism are considered by most farmers to be the most serious issue facing agricultural operations in proximity to urban areas Climb-resistant fences and/or trespass-inhibiting shrubbery are means of reducing these impacts, as is placing the buffer into private ownership (the option of allowing larger urban lots with strict setback requirements)

Odor – One of the less important agriculture-related impacts in the Rogue Valley Unless there are compelling, site specific reasons why this would be especially critical (such as the presence of a livestock feed lot), the occasional issues with odor should be sufficiently addressed by requiring that the owners, renters, and those leasing urban properties within 1,000 ft of rural agricultural land receive notice through an explicitly worded restrictive deed covenant of the negative impacts to which they will likely be exposed as a result of living within 1,000 ft. of farm land (see Appendix 3)

Dust, Smoke, and Ash – Like odor, a less important agriculture-related issue in this region, and, like odor, addressed by the use of a restrictive deed covenant

ELEMENT A – Chemical Spray Drift

Problem Overview

The off-target movement of rural agricultural chemicals can be a cause for concern to urban residents in proximity to farming areas based on fears of exposure, and/or due to associated odors Currently there is no acceptable ambient air standard for rural agricultural chemical spray drift, which, along with noise and dust, is considered a common by-product of farming practices under Oregon=s Right to Farm statute

In Oregon, research and field trials have shown that spray drift from orchard airblast type sprayers over open ground can cover distances up to 500 feet, with most falling to earth within a 200 to 300 foot distance (less when applied under optimal conditions) Spray drift from tractor-mounted boom-type sprayers is usually significantly less Although these Rogue Valley guidelines assume that farmers, as well as their employees and contractors, will use rural agricultural chemicals in accordance with reasonable and practicable measures as set out in the EPA-approved label and pesticide regulations of the state of Oregon, chemical spray drift can and will be affected by a variety of factors

chemical composition/formulation,
method of application/release height,
use of surfactants or other spray additives,
spray technology,
applicator experience,
frequency of application,
ability of target vegetation to capture spray droplets,
target structure,
weather conditions,
microclimate,
topography, and
natural and man-made landscape features

Major Buffer Design Considerations

There are several major considerations affecting the design of buffers meant to mitigate chemical spray drift

- Whether the adjoining agricultural land qualifies as "high potential impact" or "low potential impact",
- Whether the buffer will incorporate a vegetative element or not, and
- If a vegetative element is included in the buffer, whether it is designed to buffer "existing higher intensity" or "existing lower intensity" agricultural land.

Differing Levels of Potential Impact - The majority of the Class I – IV rural agricultural land to be buffered is considered to be of "high potential impact" due to the fact that it can be and often is used for a wide variety of different rural agricultural uses, and because new and as yet unforeseen uses and practices are likely to surface in the future Nonetheless, there is a recognition that some rural agricultural land, by virtue of suitability and history, is of comparatively "low potential impact" The standards for buffering these rural agricultural lands are lower, based primarily on the reduced impacts of the rural agricultural practices on these lands – 50 to 100 ft of separation between usable farmland and sensitive receptors, no vegetative buffers required, and just 50 ft. of separation for commercial and industrial uses, also without a requirement of vegetative buffers

When is Rural Agricultural Land Considered of "Low Potential Impact"?

Rural agricultural lands can be considered of low potential impact if they

1) are composed of greater than 50% Class IV soils, can demonstrate an unbroken or essentially unbroken 25-year history of rural agricultural inactivity (fallow land) or grazing use, **and** which have one or more of the following (as determined by a certified soil scientist)
   - greater than 50% hydric soils,
   - greater than 50% shallow soils (surface to bedrock or permanent cemented hardpan) of less than 2 ft in depth

OR

2) are composed of greater than 50% Class VI or worse soil

OR

3) are outside of an irrigation district's zone of influence (defined as the area within an irrigation district's present boundary, as well as areas presently lying outside, which cannot be considered ineligible on reasonable technical grounds – as determined by the most appropriate irrigation district - for a future expansion of an existing irrigation district)

Buffers Without Vegetative Elements - Buffers without vegetative buffers rely on sheer distance to control spray drift In general in the Rogue Valley, in open ground conditions (without a vegetative buffering element), minimally effective buffers between urban sensitive receptors and high potential impact rural farmland should separate the two uses by between 100 and 200 ft For non-sensitive receptors (commercial, professional, and industrial), that distance can be between 50 and 100 ft While more land is necessary for a buffer without a vegetative element than for a buffer with one, the cost and complications associated with vegetative buffers, plus the long-term maintenance, can be avoided. Additionally, future urbanization is simplified

There is flexibility in what can be included in a buffer to satisfy the required linear distances For non-vegetative buffers, distance can be achieved by including one or more of the following components

- Developable land devoted to buffering use,
- Man-made or natural features, such as infrastructure rights-of-way, roads, non-residential structures, watercourses, wetlands, ridge lines, rock outcrops, forested areas, and steep slopes;
- Non-farmable areas of the farmland being buffered (including yards, storage areas, roads, and all structures),
- Publicly owned land without significant present or projected public use (as determined by the public entity owning the land),
- Existing developed rural residential, rural commercial, or rural industrial parcels, within the urban reserve, and of at least 200' in depth as measured from a shared property line with EFU-zoned land (these parcels to be used for buffering, if contiguous with the urban reserve/rural border, must be at least 300 ft in depth to ensure future developability);
- A purchased easement (at least 200 ft in depth) on agricultural land,
- A portion (at least 200 ft in depth) of the proponent of development's land temporarily withheld from development to provide a mid-term buffer This temporarily withheld land (which could be zoned under any of the county's designations) would be eligible for development upon the annexation of the rural agricultural land it buffers;

Buffers With Vegetative Elements - Research and field trials have shown well-designed vegetative buffers can be effective in capturing up to 80% of pesticide spray drift from an application upwind of even a single row of appropriate species of trees The better designed the planting, the better the protection, and the more likely the effectiveness of the planting would be able to withstand the damage or death of individual trees Where a vegetative buffer element can be satisfactorily established and maintained, or where one exists that is of acceptable width, composition, density (or optical porosity), and location, a minimum total width of 75 ft to 100 ft for urban sensitive receptors, and 50 ft for commercial and industrial uses, will suffice

A major advantage to the proponent of development in establishing a vegetative element is the ability to halve or more than halve the separation distance (50, 75, or 100 ft instead of 100 to 200 ft), which represents a savings to development There can be further cost reductions in plant materials, labor, and material depending on whether the vegetative element is designed to buffer "existing higher intensity" or "existing lower intensity" agricultural land

Existing Higher Intensity

Rural agricultural land would qualify for an "existing higher intensity buffer" if it includes existing plantings (or scheduled plantings within one year of projected buffer completion date, as determined by documented consultation with the owner/operator of the farming operation) of long-term crops with a height at maturity exceeding 4 ft In the Rogue Valley, these are primarily vineyards and orchards (fruit or nut trees), but may also include other higher intensity crops as determined by the local Extension Serivce or the Oregon Department of Agriculture

Design Summary (see Sections A and B of Appendix 1 for full details):

Tree-based buffer – 3 rows

Bamboo-based buffer – 2 rows (20 ft between rows, 10 ft between plants)

Existing Lower Intensity

Rural agricultural land would qualify for an "existing lower intensity buffer" if it includes fallow land, land of potential high impact presently being used for grazing, or crops of any type with a height at maturity below 4 ft In the Rogue Valley these are primarily row crops and hay fields, and all uses other than those falling under the definitions of "Existing Higher Intensity"

Design Summary (see Sections A and B of Appendix 1 for full details)

Tree-based buffer – 2 rows

Bamboo-based buffer – 2 rows (20 ft. between rows, 15 ft between plants)

While the presumption is that any rural agricultural lands of high potential impact could establish crops and institute practices of higher intensity in the future (such as orchards), and thus buffers appropriate for these lands must all eventually be capable of buffering higher intensity rural agricultural practices, present use is a good indicator of near-future practices Existing higher intensity practices require a more robust buffer earlier than lower intensity uses, while buffers designed for initial lower intensity will suffice to serve less intense uses during their early development At or near functional maturity, lower intensity buffers will also suffice to provide adequate mitigation of spray drift from higher intensity uses (should those eventually occur)

The primary advantage in allowing these initial differences in buffer design is a reduction in short-term (and some long-term) costs In tree-based buffers, it is a reduction of one row of trees, from three rows in the higher intensity buffer to two rows in the lower intensity buffer (although spacing between trees is reduced slightly in the two-row buffer) In bamboo-based lower intensity buffers, there is a reduction of approximately 35% in the initial plant material required by allowing greater spacing between plants

For tree-based vegetative elements of buffers of any intensity, the requirements can be partially or fully satisfied by existing areas of trees and brush, as long as their buffering effect is essentially the same as that intended by the requirements in Appendix 1 If the characteristics of the existing vegetation do not meet the requirements in Sections A – D of Appendix 1, and so cannot substitute in full or in part for an adequate vegetative buffer, then the area can either be incorporated into the buffer design at half its "value" (for example, a 20 ft wide riparian area would be calculated as 10 ft of vegetative buffer), or it can be left out of the vegetative element and calculated at its original width (20 ft of existing vegetation would be considered as 20 ft of bare land).

Due to the fact that structures, solid walls, and other impermeable or very dense objects force air flow around or over themselves, these are not considered substitutes for vegetative buffer elements – in fact, depending on their location and characteristics, their effects may actually be counterproductive

In all cases, and under all conditions, the vegetative buffer must be designed, installed, and signed off on by licensed or certified professionals such as landscape architects, landscape contractors, arborists, irrigations systems contractors, and reforestation experts Each buffer should be designed with consideration for the unique characteristics of each site, especially aspect, existing vegetation, soil quality and depth, topography, adjacent land uses, and the microclimate Also important will be the local availability of plant materials and the use of native plants

Element A – Chemical spray drift

Objective: To locate new urban development so that the impact of rural agricultural chemical spray drift on health and amenity is avoided and complaints from residents regarding the use of rural agricultural chemicals is minimized

Performance Criteria: Urban development to be located or incorporate measures such that chemical spray drift does not adversely affect community public health and safety, and does not lead to significant levels of complaints concerning adjacent rural agricultural operations

Solution Options

HIGH Potential Impact Agricultural Land
SENSITIVE Receptors

(1) 100 ft of separation between the outermost urban sensitive receptor and the nearest farmable rural agricultural land, with an adequate tree-based vegetative buffering element The buffer must incorporate the criteria in Appendix 1, with the appropriate design keyed to the adjoining present use – higher or lower intensity The vegetative element must be located between the urban sensitive receptors and adjacent rural agricultural land, preferably closer to the spray source than the receptor The buffer can include or be entirely composed of rural agricultural land on which an easement has been purchased, and on which no agricultural activity that could lead to complaints from adjoining urban uses would be allowed

The buffer must be

- provided with a suitable watering system,
- composed of plant species that will not harbor pests or diseases damaging to the local agriculture (Appendix 1, the Extension Service, or the Oregon Departments of Agriculture or Forestry are the primary sources of information for determining this),
- acceptable to the owners of the adjoining rural agricultural land,
- provided with a legally enforceable long-term maintenance plan, and
- composed of native or locally acclimatized plants to the extent practicable

or:

(2) 75 ft of separation between the outermost urban sensitive receptor and the nearest farmable rural agricultural land, with an adequate bamboo-based vegetative buffering element The buffer must incorporate the criteria in Appendix 1, with the appropriate design keyed to the adjoining present use –

higher or lower intensity The vegetative element must be located between the sensitive receptor and adjacent rural agricultural land, preferably closer to the spray source than the receptor The buffer can include or be entirely composed of rural agricultural land on which an easement has been purchased, and on which no agricultural activity that could lead to complaints from adjoining urban uses would be allowed

The buffer must be

— provided with a suitable watering system,
— composed of plant species that will not harbor pests or diseases damaging to the local agriculture (Appendix 1, the Extension Service, or the Oregon Departments of Agriculture or Forestry should be the primary sources of information for determining this),
— acceptable to the owners of the adjoining rural agricultural land,
— provided with a legally enforceable long-term maintenance plan, and
— composed of native or locally acclimatized plants to the extent practicable

or:

(3) 200 ft of separation between the outermost urban sensitive receptor and the nearest farmable rural agricultural land without the presence of an adequate vegetative buffering element The buffer can include or be entirely composed of rural agricultural land on which an easement has been purchased, and on which no agricultural activity that could lead to complaints from adjoining urban uses would be allowed

or:

(4) 100 ft of separation with a vegetative buffer between the outermost sensitive receptor and the nearest farmable rural agricultural land through setbacks on larger individual urban lots adjoining the Urban Reserve Boundary where buffering is anticipated to be long-term Lots should be designed to provide the appropriate separation, while allowing sufficient area available for normal residential use, and shall be possible only if their use will not cause the development's average density to drop below the zone's minimum Additionally, this option shall be subject to the following

- A minimum building setback of 100 feet from the agricultural land, within which structures such as living quarters, decks, patios, gazebos, carports, pools or children's play areas cannot be located Fences may be located within this area, as may garages or storage outbuildings, provided they do not include workshop or living spaces
- Except for fences and garden-related apparatus, no structures shall be located within 50 feet of the adjacent agricultural land This area shall otherwise contain only a vegetative buffer of trees that meets the density and size requirements for lower intensity specified in Appendix 1 The buffer must be composed of plant species that will not harbor pests or diseases damaging to the local agriculture (Appendix 1, the Extension Service, or the Oregon Departments of Agriculture or Forestry are the primary sources of information for determining this), and must be provided with a suitable watering system To the extent practicable, the buffer should be composed of native or locally acclimatized plants Maintenance of the vegetative buffer is the responsibility of the urban property owner
- The vegetated buffer shall be planted no later than the final inspection
- An adequate watering system shall be installed no later than the final inspection
- A fence with a minimum height of six feet and meeting the minimum specifications in Section G of Appendix 1 shall be constructed along the property line separating the urban and rural properties The fence shall be constructed prior to final inspection Maintenance of the fence is the responsibility of the urban property owner
- The larger lots must be part of a development large enough that the loss in density can be compensated for in another portion of the development In no circumstances shall the larger lot buffers cause the overall density of the development to fall below the minimum zone density
- At the time of subdivision, restrictive covenants and/or plat notes shall provide notice of the above setbacks and buffering requirements through a statement similar to the following "Lots _____ adjoin an Urban Reserve Boundary, separating urban and agricultural land In order to preserve and protect the viability of the adjacent agricultural land, these lots are subject to additional restrictions as follows ...(reference to restrictions if a plat note or actual restrictions here if in covenants)..." Covenants shall also include the following "These provisions are regulations of the City of _____, who may take enforcement action relative thereto They may be modified or eliminated only through the recording of document(s) signed by appropriate representatives of the City of

_____ and Jackson County Modifications may occur only if appropriate to reflect changed regulations of the city, and termination shall take place only if the subject lots no longer adjoin agricultural land "

HIGH Potential Impact Agricultural Land
NON-SENSITIVE Receptors

(1) 50 ft of separation between the outermost urban industrial or commercial structure or area of regular concentrations of individuals on industrially or commercially zoned land and the nearest farmable rural agricultural land A vegetative buffer designed for lower intensity use must be included within the buffer The buffer can include or be entirely composed of rural agricultural land on which an easement has been purchased, and on which no agricultural activity that could lead to complaints from adjoining urban uses would be allowed The buffer must incorporate the criteria in Appendix 1, and must be

— provided with a suitable watering system,
— composed of plant species that will not harbor pests or diseases damaging to the local agriculture (Appendix 1, the Extension Service, or the Oregon Departments of Agriculture or Forestry should be the primary sources of information for determining this),
— acceptable to the owners of the adjoining rural agricultural land,
— provided with a legally enforceable long-term maintenance plan, and
— composed of native or locally acclimatized plants to the extent practicable

or:

(2) 100 ft of separation between the outermost urban industrial or commercial structure or area of regular concentrations of individuals on industrially or commercially zoned land and the nearest farmable rural agricultural land The buffer can include or be entirely composed of rural agricultural land on which an easement has been purchased, and on which no agricultural activity that could lead to complaints from adjoining urban uses would be allowed

LOW Potential Impact Agricultural Land
SENSITIVE Receptors

(1) 100 ft of separation between the outermost urban sensitive receptor and the nearest portion of low potential impact land suitable for any rural agricultural use The buffer can include or be entirely composed of rural agricultural land on which an easement has been purchased, and on which no agricultural activity that could lead to complaints from adjoining urban uses would be allowed

or:

(2) 50 ft of separation between the outermost urban sensitive receptor and the nearest portion of low potential impact land suitable for any rural agricultural use through setbacks on larger individual lots immediately adjacent to the rural farmland being buffered The lots must be of sufficient size to allow a minimum setback of 50 ft , within which structures such as living quarters, decks, patios, gazebos, carports, pools or children's play areas cannot be located Fences may be located within this area, as may garages or storage outbuildings, provided they do not include workshop or living spaces

LOW Potential Impact Agricultural Land
NON-SENSITIVE Receptors

(3) 50 ft of separation between the outermost urban industrial or commercial structure or area of regular concentrations of individuals on industrially or commercially zoned land and the nearest portion of low potential impact land suitable for any rural agricultural use The buffer can include or be entirely composed of rural agricultural land on which an easement has been purchased, and on which no agricultural activity that could lead to complaints from adjoining urban uses would be allowed

ELEMENT B – Noise

Problem Overview

There are several sources of noise generally associated with rural agricultural activity in the Rogue Valley that may lead to land use conflict These are noises associated with intensive livestock facilities, constant or very long-term noise from fixed installations (e g pumps, refrigeration and processing plants), and occasional or intermittent noise from tractors, wind-generating frost control equipment, spray equipment, and other machinery Of these, the most important are occasional or intermittent noises from wind machines, tractors, and spray equipment (especially airblast sprayers)

The recommendations that follow are designed to mitigate the most serious noise impacts, but will not fully resolve the issue Noise from rural agricultural activities, especially the relatively occasional noise from wind machines, tractors, and spray equipment are part of the reality of rural life. Individuals choosing to live in proximity to rural agricultural land must understand that this proximity exposes them to inconveniences that are endemic to the area in which they have chosen to live

Many noise-generating activities associated with agriculture are intermittent and may affect a particular adjacent residence for only a few hours several times a year (e g wind machines in orchards, bird cannons in berries or grapes). **However, it should be noted that many farm activities require operation of equipment in the evening or very early morning hours due to crop or livestock conditions or critical temperature and wind condition parameters that, despite the personal wishes of the farmer, effectively dictate the necessity and timing of such activities.** It should also be noted that the nighttime or very early morning operation of rural agricultural equipment on a given parcel can and will differ from year to year, depending on climatic conditions and the type of crop

Due to the comparatively intensive settlement of the Rogue Valley, and the high level of urban intrusion into rural agricultural areas, the most effective and basic means of mitigating for noise—through separation distances that might have to measure in the several thousands of feet—is not feasible On the other hand, noise from rural agricultural operations is one of the most controversial and polarizing issues within the residential/rural agricultural interface, and must be addressed as an issue in effective buffer designs A reasonably effective, financially feasible means of buffering for noise in the Rogue Valley must be a compromise between cost and results

Assumptions

One strategy in addressing the issue of noise is a strong, explicit restrictive deed covenant directed at the owners of urban land in proximity to rural agricultural land. As stated previously, individual urban land owners must be informed, in detail, of the range of impacts they will be exposed to living within 1,000 feet of rural farmland, with noise being one of the most potentially significant of these This notification is critical because noise from rural agricultural operations cannot be cost-effectively mitigated to the degree that spray drift can, and therefore will likely remain a contentious issue in the future in some parts of the valley

One major reality of cost-effective noise buffering is a focus on "interior noise exposure" as the measure of noise level acceptability, rather than a combination of interior and exterior and/or day and night noise levels The control of interior noise levels is practical with the use of strategies such as structure orientation, construction standards, noise mitigating materials, the distribution of rooms within the house, the use of auxiliary structures such as garages to block sound, and the use of terrain and natural features to affect the intensity of sound that reaches and is transmitted through the structure While it is true that some of these, such as the orientation of structures, and the use of terrain and natural features of the area can also mitigate exterior noise levels, the effect will probably

not be as consistent across a property or in all situations

The major reason that mitigating for exterior noise levels is not feasible is the cost-benefit of addressing rural agricultural noises that are intermittent at best, usually not exceeding 150 – 200 hours per year, and that are inherently and technically difficult to address. The few potential strategies to address exterior noise – distance, barriers, and reduction of source machine output - all present significant constraints to reasonable mitigation

Relying on distance is not a viable option for much the same reason that it wasn't the mechanism of choice for spray drift – too land intensive To achieve an exterior noise level of just a typical quite daytime urban area would require approximately 1,500 ft It could take another 500 ft or more to reach the level of a quiet urban nighttime

An alternative to distance in mitigating exterior noise levels would be a sound barrier of the type used alongside highways Not only are the aesthetic drawbacks of such construction considerable (especially since most people locating on the urban fringes are doing so because of the attraction of the rural landscape), but the cost of such walls would be considerable In addition, they are only effective if they interfere with the line of sight of receptor and source — taller buildings from the urban side, wind machines from the rural side, and significant slopes on either side would reduce the effectiveness of the barrier Finally, because of its height and lack of permeability, a sound barrier could actually be counterproductive for spray drift mitigation

The last major potential mechanism in noise mitigation would be the reduction of the source machines' output. To date, the only real effective means of mitigating noise source directly is the construction of a containment building, such as a pump house or a building for a generator, for fixed noise producers Because the most significant agricultural noise producers are not small, fixed machines, but rather are large and fixed (such as a wind machine) or mobile (such as a tractor with or without spray equipment), the potential for direct noise mitigation is not significant.

The main advantage of using interior noise levels as a measure of adequate noise mitigation is the fact that the vast majority of complaints about rural agricultural noise occur when that noise is generated at night and in the early morning, between the hours of 10 00 PM and 6 00 AM, at which time potential complainants are invariably attempting to sleep This means that the individuals to be buffered from the noise are usually in a controllable space that is relatively easily engineered The main disadvantage of relying on interior noise levels is the human factor For a noise mitigation strategy that incorporates a number of measures to reduce the total sound transmission into a living space to be effective, people must cooperate Just one open window can defeat even the costliest noise mitigation measures Nonetheless, it is a reasonable assumption that individuals with full knowledge that they are choosing to live in an area in which they will be exposed to certain noise levels on an intermittent basis (at any time of night and day), and who are provided with the means (such as their windows) to mitigate these occasional unacceptable levels of noise, should be expected to do so when it becomes necessary

Noise Levels and Buffering Strategies

In all circumstances in which buffering from chemical spray drift is required, noise mitigation is indicated for urban sensitive receptors within the first 500 feet of the rural/urban boundary These 500 feet are divided into four Noise Zones (see section F of Appendix 1 for details) Each Noise Zone specifies Sound Transmission Class (STC) ratings for the exterior envelope sufficient to mitigate agricultural noise to an approximate interior nighttime level of 45 d(B)A For all noise mitigating solution options, an agricultural noise source of 90 dB(A), of mid to higher frequencies, is used as the most likely higher-level rural agricultural noise The agricultural noise source is assumed to be located

25 ft from the rural/urban boundary, and is assumed to have attenuated (lessened) to 90d(B)A at the urban/rural boundary The use of this noise standard of 90 dB(A) compares favorably with readings conducted in the Rogue Valley on the most commonly complained-about noise producers—tractors, airblast sprayers, and wind machines

Element B – Noise from rural agricultural activities

Objective: To mitigate the interior noise impacts of rural agricultural activities

Performance Criteria: Sensitive receptors to be located or incorporate measures such that rural agricultural noise does not adversely affect community public health and safety, and does not lead to significant levels of complaints concerning adjacent rural agricultural operations

Solution Options

HIGH or LOW Potential Impact Agricultural Land
SENSITIVE Receptors

(1) Construction and placement of urban sensitive receptors within 500 ft of the rural/urban boundary will comply with the following criteria for the acoustic design of the exterior building envelope and for the ventilating system and its parts (see details in Section F of Appendix 1)

Noise Zone 1	0 to 50 ft from rural/urban boundary	no new sensitive receptors
Noise Zone 2	51 to 175 ft from rural/urban boundary	exterior walls = STC-45 exterior windows = STC-38 exterior doors = STC-33 roof/ceiling assembly = STC-49 ventilation = see F2 in Appendix 1 for details
Noise Zone 3	176 to 375 ft from rural/urban boundary	exterior walls = STC-40 exterior windows = STC-33 exterior doors = STC-33 roof/ceiling assembly = STC-44 ventilation = see F2 in Appendix 1 for details
Noise Zone 4	376 to 500 ft from rural/urban boundary	exterior walls = STC-35 exterior windows = STC-28 exterior doors = STC-26 roof/ceiling assembly = STC-39 ventilation = see F2 in Appendix 1 for details

or:

(2) Design measures from a qualified acoustic consultant will be incorporated in community and individual structure design to achieve a sound transmission loss sufficient to reduce exterior noise levels to a maximum of 45 dB(A) within sensitive receptor structures A standard agricultural noise source of 90dB(A) of mid to higher frequencies, measured at the rural/urban growth boundary, and originating 25 ft into the rural property, is assumed

ELEMENT C – Sediment and Stormwater Run-off

Overview

Urban development affects land surface characteristics and the hydrological balance, with the impacts often occurring on farmland located lower in the landscape The increase of impermeable surfaces and changes to drainage patterns can accelerate soil erosion, siltation and sedimentation, and increase the risk of flooding Techniques to alleviate conflict due to downstream effects of residential development highlight suitable erosion, sediment, and stormwater control during the construction and operational stages of a development.

Buffering Considerations

Whenever possible, the 50 to 200 ft width of the spray drift buffers should be considered an important option for mitigating sediment and stormwater run-off Options can include provisions for erosion controls during the construction and operation phases of the development, and permanent management of stormwater run-off If the use of the buffer areas is not possible, all erosion control and permanent stormwater management must take place within the built portion of the development **Ongoing maintenance and enforcement must be identified and incorporated into the conditions of approval prior to the start of construction.**

Element C – Sediment and stormwater run-off from development

Objective: To design new urban development so that the impact of run-off and sediment from urban development areas onto rural agricultural land is minimized

Performance Criteria: Urban development to be located or incorporate measures to minimize the impact of urban-derived sediment and storm water run-off onto rural agricultural land

Solution

HIGH or LOW Potential Impact Agricultural Land
SENSITIVE or NON-SENSITIVE Receptors

Urban development proposals to include the following

(1) Urban development proposals to include the following
an erosion control and prevention plan for the construction and operation phases of the development that meet current federal, state, and local standards, especially as concerns the conveyance of stormwater run-off from all hard surfaces (including roads, roofs, driveways etc) to stable waterways, and measures such as water detention and retention implemented within the buffer area and/or the built area to reduce peak flow during runoff events to levels acceptable for the existing stream

ELEMENT D – Trespass and Vandalism

Overview

One of the most damaging effects of urban proximity to farmland is the issue of trespass and vandalism Trespass is important not just because it is the necessary precursor to vandalism, but because of the significant liability issues connected with the accidental exposure of trespassers to chemicals and the danger of heavy machinery Vandalism itself may be the single most common reason given by many agriculturists with land adjacent to urban areas for claiming that their land is no longer agriculturally viable Interestingly, vandalism is often highest in areas with elevated levels of complaints from nearby residents about noise and chemical spray

Buffering Considerations

Although important in creating a physical separation between development and rural agricultural land, the width of the spray drift buffers themselves, even with a vegetative element, will not prevent trespass In fact, without the inclusion of some element to frustrate trespass, buffers could be the object of vandalism themselves, thus potentially compromising their ability to appropriately mitigate spray drift Unless there is a significant natural barrier to trespass incorporated into the buffer, such as a steep draw, a deep, permanent creek, a very dense, established stand of blackberries, a cliff, or something similar, a fence or other man-made barrier will have to be incorporated As specified in Section G of Appendix 1, the recommended man-made barrier is a minimum 6 ft chain link fence designed to be difficult to scale If the fence is to be added to a larger lot residential setback buffer, it may be of other materials, but must be of the same minimum height and must be climb resistant With the residential setback buffers, the fence is to be established at the urban/rural property line, with all other non-vegetative, non-setback buffers the fence should be on the development/buffer boundary (or, if there is some community use of part of the buffer, then between the community use and the rest of the buffer), and with vegetative buffers, on the development side of the vegetative element (or, if there is some community use of part of the buffer, then between the community use and the rest of the buffer) See Section G of Appendix 1 for potential fence placements In lieu of a fence, trespass-inhibiting shrubs may be planted. These shrubs would become part of the buffer, and would have to be established at the same time the buffer is

Element D – Trespass and vandalism from urban development

Objective: To provide protection for rural agricultural land from trespass and vandalism

Performance Criteria: Natural or man-made barriers to be incorporated in buffers to provide protection for rural agricultural land from trespass and vandalism originating from urban development

Solution Options

HIGH or LOW Potential Impact Agricultural Land
SENSITIVE or NON-SENSITIVE Receptors

(1) Incorporate significant natural barriers in buffer areas,

or:

(2) Establish a minimum 6 ft climb-resistant fence of durable materials either on the rural/urban property line of residential setback buffers, on the buffer/development boundary of non-vegetative, non-setback lot buffers (or, if there is some community use of part of the buffer, then between the community use and the rest of the buffer), and with vegetative buffers, on the development side of the vegetative element (unless there is an agreed-upon need for access to the vegetative element from the development side) See Section G of Appendix 1 for details

or:

(3) Establish a planting of trespass inhibiting shrubs These shrubs can be incorporated in a vegetative element, or can be stand-alone They must adhere to the criteria in Section G of Appendix 1.

ELEMENT E – Odor

Overview

Odor has been determined to be of lesser importance in the majority of cases in the Rogue Valley Odor in rural areas can arise from use of rural agricultural chemical sprays, fertilizers, effluent disposal, intensive livestock operations, and composting plants. Such odors can have a negative impact on urban residential quality of life, but rarely have the potential to affect public health Confined animal feeding operations (CAFOs) are subject to their own set of regulations

Odor is often a major factor in many complaints about off-site chemical spray drift where there is actually no real toxic exposure Some rural agricultural chemicals contain >markers=(strong odors) to allow easy identification, so it is these markers or mixing agents that are often detected at some distance from the target area and cause concern, even though in many instances only extremely low levels of the active ingredients may be present Residents=association of the odor with the chemical is sufficient to raise fears of exposure

Factors affecting complaints from odor are influenced by the frequency, intensity, duration and offensiveness of the odor An objectionable odor may be tolerated if it occurs infrequently at a high intensity, however, a similar odor may not be tolerated at lower levels if it persists for a longer duration or more frequently In addition, tolerance of rural agricultural odors is highly subjective and varies greatly among individuals.

Odor can be emitted from a variety of sources and is dispersed by the atmosphere, and typically seems worse during hot weather Ground level concentrations of odor have been reported as being inversely related to wind speed and atmospheric conditions, i e the lower the wind speed and the more stable the conditions, the higher the concentration The subjective nature of conflict resulting from exposure to odor makes the determination of design goals difficult Unlike chemical spray drift that is in the form of liquid droplets, odors are in the form of gases and can thus travel and be detected at greater distances Other than relying on the restrictive covenant, no feasible cost effective measures are available to the developing urban areas for mitigating most odor issues

Element E – Odor

Objective: Odor as a by-product of rural agricultural operations will have a minimal negative effect on rural agricultural operations

Performance Criteria: Awareness of the probability of rural agricultural operations causing odor, and of their right to do so under Oregon law, will be emphasized

Solution

HIGH or LOW Potential Impact Agricultural Land
SENSITIVE or NON-SENSITIVE Receptors

(1) All urban properties within 1,000 ft of rural agricultural lands will have a restrictive covenant attached to their deeds clearly stating that urban residents in proximity to rural agricultural land will likely be exposed to a variety of odors from agricultural operations

ELEMENT F – Dust, Smoke, and Ash

Overview

Dust, smoke, and ash, like odor, have been determined to be of lesser importance in the Rogue Valley Although some rural agricultural activities, including cultivation prior to planting, tractor and transport movements, crop harvest, legal frost protection heaters, and prescribed fires for disease control can generate dust, smoke, and ash, this is considered to be of little importance as a rural/urban antagonist in the Rogue Valley As with odor, above, the inclusion of the probability of exposure to dust, smoke, and ash in the restrictive covenant is considered sufficient mitigation

Element F – Dust, smoke, and ash

Objective: Dust, smoke, and ash, as a by-product of rural agricultural operations will have a minimal negative effect on rural agricultural operations

Performance Criteria: Awareness of the probability of rural agricultural operations causing dust, smoke, and ash, and of their right to do so under Oregon law, will be emphasized

Solution

HIGH or LOW Potential Impact Agricultural Land
SENSITIVE or NON-SENSITIVE Receptors

(1) All urban properties within 1,000 ft of rural agricultural lands will have a restrictive covenant attached to their deeds clearly stating that urban residents in proximity to rural agricultural land will likely be exposed to dust, smoke, and ash from agricultural operations

Buffering Design Criteria
Summary Tables

HIGH Potential Impact Agricultural Land
SENSITIVE Receptors (all residential uses, hotels, motels, schools, places of worship, medical centers, etc)

	CHEMICAL SPRAY DRIFT				TRESPASS AND VANDALISM	NOISE			SEDIMENT / STORMWATER RUN-OFF	ODOR, DUST, SMOKE, & ASH
	tree-based buffer	bamboo buffer	larger lot tree-based buffer	non-vegetative buffer	fencing / shrubbery	noise zone 2 criteria	noise zone 3 criteria	noise zone 4 criteria	erosion control and prevention plan	restrictive deed covenant
Option 1										
0 to 100 ft	✔				✔				✔	
101 to 175 ft						✔			✔	✔
176 to 375 ft							✔		✔	✔
376 to 500 ft								✔	✔	✔
500 to 1000 ft										✔
Option 2										
0 to 75 ft		✔			✔				✔	
76 to 175 ft						✔			✔	✔
176 to 375 ft							✔		✔	✔
376 to 500 ft								✔	✔	✔
500 to 1000 ft										✔
Option 3										
0 to 100 ft			✔		✔				✔	✔
101 to 175 ft						✔			✔	✔
176 to 375 ft							✔		✔	✔
376 to 500 ft								✔	✔	✔
500 to 1000 ft										✔
Option 4										
0 to 200 ft				✔	✔				✔	
201 to 375 ft							✔		✔	✔
376 to 500 ft								✔	✔	✔
500 to 1000 ft										✔

NOTES
- The distances in this chart are linear distances from the rural/urban boundary, and assume that all buffering takes place on urbanizing land If all or part of a buffer is located on rural land, distances will be measured from the beginning of the buffer, and not from the beginning of the boundary
- Vegetative buffer elements will be maintained and protected through a variety of different agreements If a restrictive covenant is used for this purpose, it would be in addition to the restrictive covenant used to mitigate odor, dust, smoke, & ash, chemical spray drift, and noise
- Noise Zone 1 does not appear in this chart because no new sensitive receptors are permitted in that zone
- Larger lot tree-based buffers are only allowed on urban lands adjacent to the outermost urban reserve boundary

HIGH Potential Impact Agricultural Land
NON-SENSITIVE Receptors (commercial, industrial)

	CHEMICAL SPRAY DRIFT		TRESPASS AND VANDALISM	SEDIMENT / STORMWATER RUN-OFF	ODOR, DUST, SMOKE, & ASH
	tree or bamboo-based buffer	non-vegetative buffer	fencing / shrubbery	erosion control and prevention plan	restrictive deed covenant
Option 1					
0 to 50 ft	✔		✔	✔	
51 to 175 ft				✔	✔
176 to 375 ft				✔	✔
376 to 500 ft				✔	✔
501 to 1000 ft					✔
Option 2					
0 to 100 ft		✔	✔	✔	
101 to 175 ft				✔	✔
175 to 375 ft				✔	✔
376 to 500 ft				✔	✔
501 to 1000 ft					✔

NOTES
- The distances in this chart are linear distances from the rural/urban boundary, and assume that all buffering takes place on urbanizing land If all or part of a buffer is located on rural land, distances will be measured from the beginning of the buffer, and not from the beginning of the boundary
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LOW Potential Impact Agricultural Land
SENSITIVE Receptors (all residential uses, hotels, motels, schools, places of worship, medical centers, etc)

	CHEMICAL SPRAY DRIFT / TRESPASS AND VANDALISM		TRESPASS AND VANDALISM	NOISE			SEDIMENT / STORMWATER RUN-OFF	ODOR, DUST, SMOKE, & ASH
	non-vegetative buffer	larger lot non-veg buffer	fencing / shrubbery	noise zone 2 criteria	noise zone 3 criteria	noise zone 4 criteria	erosion control and prevention plan	restrictive deed covenant
Option 1								
0 to 50 ft		✔	✔				✔	✔
51 to 175 ft				✔			✔	✔
176 to 375 ft					✔		✔	✔
376 to 500 ft						✔	✔	✔
501 to 1000 ft								✔
Option 2								
0 to 100 ft	✔		✔				✔	
101 to 175 ft				✔			✔	✔
175 to 375 ft					✔		✔	✔
376 to 500 ft						✔	✔	✔
501 to 1000 ft								✔

NOTES
- The distances in this chart are linear distances from the rural/urban boundary, and assume that all buffering takes place on urbanizing land If all or part of a buffer is located on rural land, distances will be measured from the beginning of the buffer, and not from the beginning of the boundary
- Vegetative buffer elements will be maintained and protected through a variety of different agreements If a restrictive covenant is used for this purpose, it would be in addition to the restrictive covenant used to mitigate odor, dust, smoke, & ash, chemical spray drift, and noise
- Noise Zone 1 does not appear in this chart because no new sensitive receptors are permitted in that zone
- Larger lot tree-based buffers are only allowed on urban lands adjacent to the outermost urban reserve boundary

LOW Potential Impact Agricultural Land
NON-SENSITIVE Receptors (commercial, industrial)

	CHEMICAL SPRAY DRIFT / TRESPASS AND VANDALISM	TRESPASS AND VANDALISM	SEDIMENT / STORMWATER RUN-OFF	ODOR, DUST, SMOKE, & ASH
	non-vegetative buffer	fencing / shrubbery	erosion control and prevention plan	restrictive deed covenant
Option 1				
0 to 50 ft	✔	✔	✔	
51 to 175 ft			✔	✔
176 to 375 ft			✔	✔
376 to 500 ft			✔	✔
501 to 1000 ft				✔

NOTES

- The distances in this chart are linear distances from the rural/urban boundary, and assume that all buffering takes place on urbanizing land If all or part of a buffer is located on rural land, distances will be measured from the beginning of the buffer, and not from the beginning of the boundary
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VIII – DEVIATING FROM THE GUIDELINES

Should the proponent of development elect to pursue a buffer design that proposes less linear separation or less of a vegetative element than specified in the minimally acceptable solutions, or that differs materially in other ways (other than increasing the linear distance or the amount of vegetative element) the buffer would be considered a "flexed" design

When is a Buffer Design Not Considered Flexed?

A buffer design is not considered flexed when existing elements consistent with the purpose of the buffer are incorporated in the buffer

For buffers without vegetative buffer elements, the requirements of linear distance can be achieved by elements such as the following

- Man-made or natural features such as infrastructure rights-of-way, roads, non-residential structures, watercourses, wetlands, ridge lines, rock outcrops, forested areas, and steep slopes ,
- Non-farmable areas of the farmland being buffered (including yards, storage areas, roads, and all structures),
- Publicly owned land without consistent present or projected public use (as determined by the public entity owner)
- An easement on agricultural land purchased by the proponent of development,
- Rural residential, commercial, or industrial land without a significant history of complaints related to adjoining farm use, whose owners agree in writing to the use of their land as part of the required buffer area, and
- Other open areas (except undeveloped rural residential, commercial, or industrial parcels) that are considered appropriate to the purpose of the buffer

For buffers with vegetative elements, the requirements can be partially or fully satisfied by existing areas of trees and brush, as long as their buffering effect is essentially the same as that intended by the requirements in Appendix 1 If the characteristics of the existing vegetation do not meet the requirements in Appendix 1, and cannot substitute in full or in part for an adequate vegetative buffer, then the area can either be incorporated into the buffer design at half its "value" (for example, a 20 ft wide riparian area would be calculated as 10 ft of vegetative buffer), or it can be left out of the vegetative element and calculated at its original width (20 ft of existing vegetation would be considered as 20 ft of bare land)

Whenever the proposed buffer design varies from the minimum buffering options described in these guidelines, the proponent of development is responsible for the preparation of a **Conflict Assessment and Buffer Study (CABS) If no material variation is sought from the minimum buffering guidelines, the CABS is not necessary**

What must be included in the CABS?

The CABS must

a Determine the present and likely future agricultural land use activities with the potential of causing problems for adjacent urban development The determination of likely agricultural practices should be based on factors such as soil type, topography, parcel size, shape, and location, infrastructure, microclimatic conditions, regional rural agricultural practices and crops, and the farming history of the parcel and surrounding similar parcels

b Determine how the proposed urban development will likely impact the management and

operation of nearby farmlands All owners of resource land within 1,000 ft of the land proposed for development will be interviewed, and full transcripts of those interviews will be attached to the CABS

c Identify the elements that may cause conflict and the extent of the conflict, from both the urbanizing as well as from the rural agricultural The elements should be quantified, where possible, in terms of frequency and duration of activities to determine the element's impacts As part of this evaluation, the CABS must consider the likely future uses determined in (a) above The buffering mechanisms that are proposed must be sufficient to accommodate these potential future uses NOTE The current financial viability of a particular crop will not be considered an important limiting factor in determining potential future use

d Propose a set of buffering measures that will achieve acceptable buffering outcomes – these may include, but not be limited to, the siting of residences, size and geometry of lots, separation widths, communal open space, vegetation, natural landscape features, acoustic features, etc

e Propose the means by which the proposed buffering measures will be monitored and maintained This should include responsibility for implementing and maintaining specific features of the buffer areas to ensure continued effectiveness Acknowledgment of the authority responsible for ensuring compliance with any agreement will be plainly cited

f Establish a timeline for the development that establishes when the buffer will be installed It shall be assumed that the buffer will be established prior to either final plat sign off or final building inspection (for larger lot buffers and in the event no land division occurs)

The CABS must be prepared by appropriate experts under contract with the proponent of development, and upon completion of a final draft, must be submitted to the owners and operators of rural agricultural land within 1,000 ft of the boundary between the rural and proposed urban uses These owners and operators will be given a month to provide input on the CABS, and such input will be attached to the CABS All costs incurred in the preparation of the CABS will be the responsibility of the proponent of development The non-refundable base fee for the CABS, payable to Jackson County to offset the costs of the Agricultural Buffering Committee, is $1,000 Starting in 2010, this base fee will be increased annually for inflation or as deemed appropriate by the Jackson County Commissioners to offset real costs

The draft CABS must be reviewed and a recommendation forwarded to the appropriate city planning commission by the Agricultural Buffering Committee, which will be comprised of appropriate experts appointed by the Jackson County Board of Commissioners The Agricultural Buffering Committee shall be considered an ad hoc advisory committee to the city planning commission in whose jurisdiction the development is proposed

The Agricultural Buffers Committee

The 10 to 15 members of the Agricultural Buffering Committee shall have expertise in as many of the following fields as possible

Soil Science, Agronomy, Dendrology and/or Forestry, Agrochemicals, Landscape Architecture, Animal Husbandry, Orchard Management, Horticulture, Farming, Ranching, and Parks and Recreation

In addition, there shall be a permanent member of the Jackson County Planning Department or Planning Commission, and an open non-voting position to be filled on an as-needed basis by a member of the affected city's planning department or planning commission The Committee shall elect co-chairs from the non-jurisdiction membership

Should the Agricultural Buffering Committee fail to recommend the CABS, a mediated solution between the city, county, proponent of development, and the co-chairs of the Agricultural Buffering Committee will be required before the planning and application process can proceed The proponent is responsible for meeting the expenses of the mediation process If a mediated settlement is not successful, the Agricultural Buffering Committee will forward a negative recommendation on the CABS to the city planning commission with the Committee's recommended changes to the flexed buffer design

Should the Agricultural Buffering Committee, in the course of its review of the flexed buffer proposal, require expert assistance, the proponent of development will be notified of the cost of that technical assistance The proponent of development may suggest an alternative to the identified technical assistance, but the Committee will make the final selection If the proponent of development does not agree to the cost of the technical assistance, the flexed buffer design will receive a negative recommendation without any further analysis

Should the city decide to favor the proponent's flexed design over the recommendations of the Agricultural Buffering Committee, a major regional review would then be triggered under the guidelines set forth in the Greater Bear Creek Regional Problem Solving Plan Stakeholders Agreement