

# FRONTIER: A New Definition

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*The Final Report of the Consensus Development Project*

**"Consensus - an opinion held by all or most."**

Webster's New World Dictionary

**Funded by the Office of Rural Health Policy  
Health Resources and Services Administration  
Department of Health and Human Services**

**Frontier Education Center  
Ojo Sarco, New Mexico**

**April, 1998**

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## **ABSTRACT**

Considerable debate has been held through the years about how to best define "rural." Since the early 1980's, this discussion has expanded to include how to best define the most sparsely populated areas of the United States - what we call frontier.

This discussion was stimulated by a series of articles published by Rutgers University land use planner, Frank Popper, PhD. Dr. Popper wrote that Frederick Jackson Turner had incorrectly declared the end of the frontier after the 1890 census. Popper stated that, even after the 1980 census, there were still large frontier areas in the United States characterized by both remoteness and sparse population. Popper's writings stimulated a 16 year discussion among rural health advocates about how to define frontier and what makes a frontier health care delivery system unique.

In 1997, the Office of Rural Health Policy contracted with the Frontier Education Center to conduct a consensus process to develop a definition of frontier which would be more generally acceptable than using only a single factor - population density within a county.

In April of 1998, consensus was achieved. A matrix of population density, distance to the closest "market" for services, and travel time was developed. A full discussion of the process and the definition follows.

## **Description of the Process**

"Consensus - an opinion held by all or most."  
Webster's New World Dictionary

## **BACKGROUND**

Frontier advocates have been asking for a definition of frontier which has broad support. In the past, the single criteria of population density was used by two federal programs and a number of states. This method did not allow for consideration of frontier extremes caused by long distances to services in communities which had higher population densities.

This approach has also lead to multiple definitions, even within a single agency. For example, within the federal Department of Health and Human Services, two programs of the Health Services and Resources Administration use different definitions of frontier. The Bureau of Primary Health Care in 1986 defined a frontier area as those counties having six or fewer people per square mile. In 1988, Congress passed "Section 799A, Health Care in Rural Areas," administered by the Bureau of Health Professions. This legislation defines frontier as less than seven persons per square mile.

## **FRONTIER EDUCATION CENTER ESTABLISHED**

In response to the need for an organization solely dedicated to frontier communities, the Frontier Education Center came together and incorporated in 1997. The mission of the Frontier Education Center is to serve as the clearinghouse and central point of focus for frontier research, education, and advocacy.

The first task undertaken by the Frontier Education Center was to bring together an expert panel from around the United States to develop a definition for "frontier" which was agreed upon by consensus. The Frontier Education Center wanted to assure that the definition of "frontier" was developed through a pure consensus process. A description of the process follows.

## **INTRODUCTION TO THE CONSENSUS PROCESS**

The effort to develop a consensus among a group of people is the most democratic way to make sure that all concerns are heard and incorporated into any decision made by the group. Before making a decision, the group is asked if there are any concerns. If no concerns are expressed, it is concluded that consensus has been reached.

If concerns are expressed, the individual raising the concern must state if they have a "blocking concern" or if they are willing to "stand aside."

- Blocking Concern

When a blocking concern is raised, the decision cannot proceed on the basis of consensus. If the blocking concern cannot be resolved, a vote must be taken. A blocking concern is very serious and can only be used if the integrity of the process or decision is questioned by the party raising the concern.

If, after further discussion and modification of the proposed decision, the blocking concern is resolved to the satisfaction of the person who raised it, the blocking concern is withdrawn and consensus is preserved.

- Stand Aside

A person may stand aside from consensus. This is the way to indicate a disagreement, but it is not strong enough to be a blocking concern. Standing aside is an indication of a serious personal disagreement but still allows the consensus process to conclude.

## **FRONTIER DEFINITION SUCCESSFULLY ADOPTED THROUGH CONSENSUS**

Using the consensus process described above, a group of experts helped the Frontier Education Center develop a definition which was adopted unanimously. The workgroup had considerable discussion through written materials as well as conference calls to develop the guidelines for the process. Two elements that emerged immediately were:

- the final definition had to allow for extremes of distance and isolation population density
- any use of the definition must reflect the underlying knowledge that the real frontier dilemma is how to

create or maintain even a fragile infrastructure in a frontier community.

To initiate the process, a packet of background materials was sent to all workgroup members. They were also sent a series of possible elements of a definition which members then scored in rank order of preference. This constituted Round 1 of the process.

Round 1 was then collated. The scoring as well as workgroup members' comments and suggestions were aggregated and then re-circulated as Round 2. As workgroup members contributed articles, new information about efforts to establish rural definitions, and Census Bureau considerations for the year 2000 Census, these were always forwarded to all members to assist them in making the best informed decision for a frontier definition.

Ultimately it took six rounds of comments and scoring to achieve true consensus - a unanimous satisfaction with the definition. At the end of Round 4, there was almost a consensus - until a workgroup member raised a blocking concern that all eligibility points should not be met with only a single criterion. The final scoring was modified to require points from at least two of the three cells of the matrix in order to meet the definition of frontier. With this modification, the blocking concern was removed and consensus was reached.

## **RATIONALE FOR SELECTED POPULATION DENSITIES**

Previous definitions of frontier were based only on very low population densities. This led to many geographic areas with higher population densities being excluded, despite their isolation from a market or service center and lack of infrastructure. Conversely, previous definitions led to very sparsely populated counties being included, even if they were in close proximity to a more populous area. The Frontier Education Center has resolved this through the matrix which allows for the inclusion of extremes of isolation (distance), as well as population density.

A map of the United States and accompanying table (see Attachments: 1990 U. S. Population Density and Population Statistics by Density Category for the U. S.) were developed by the Frontier Education Center to facilitate the assessment of various population densities. When the Workgroup learned that even going as high as 20 persons per square mile would still be less than 4% of the total United States population, they opted for that density as the upper limit for a frontier community.

It is critical to remember that not all communities with a population density of 20 per square mile would be designated as frontier – only those located more than 60 miles and/or 60 minutes from the nearest market center. Locations with a higher population density are required to have an extreme of time and/or distance to qualify. Most communities at the higher limit of population density will not be frontier, they will be either rural or suburban/urban adjacent.

The total population, in those frontier areas in the United States designated by the criteria in the matrix, will remain quite small. Providers and policy makers from a number of frontier states have determined that the matrix is inclusionary of the extremes of frontier communities. At the same time, communities currently designated may be eliminated if they are located adjacent to larger communities.

## The Definition

The following matrix is the tool for determining designation as frontier.

### DESIGNATION OF FRONTIER

Total Possible Points 105

Minimum Points Necessary for Frontier Designation = 50

"Extremes" = 55 –100

DENSITY	PERSONS PER SQUARE MILE	POINTS
	0-12	45
	12.1-16	30
	16.1-20	20
<b>NOTE: PER COUNTY OR PER DEFINED SERVICE AREA WITH JUSTIFICATION</b>		
<b>TOTAL POINTS DENSITY</b>		<input type="text"/>
DISTANCE IN MILES	TO SERVICE/MARKET	POINTS
	>90 MILES	30
	60-90	20
	30-60	10
	<30	0
<b>NOTE: STARTING POINT MUST BE RATIONAL, EITHER A SERVICE SITE OR PROPOSED SITE</b>		
<b>TOTAL POINTS DISTANCE IN MILES</b>		<input type="text"/>
TIME IN MINUTES	TO SERVICE/MARKET	POINTS
	>90 Minutes	30
	60-90	20
	30-60	10
	<30	0
<b>NOTE: USUAL TIME; EXCEPTIONS MUST BE DOCUMENTED (ie; WEATHER, GEOGRAPHY, SEASONAL)</b>		
<b>TOTAL POINTS TIME IN MINUTES</b>		<input type="text"/>
<b>TOTAL POINTS ALL CATEGORIES</b>		<input type="text"/>

Note: This matrix can be copied or used by any individual, organization or agency with notification to the Frontier Education Center.

## **Using the Matrix**

The matrix is a tool for determining frontier status. It establishes a graphic mechanism for scoring population density and isolation/distance. An area receives points for ranges of population density and miles or minutes distant from a market. Using this method, any area which receives a minimum of 50 points will be considered frontier.

## **Ease of Implementation for State/Federal Programs and Policy Officials**

One of the concerns expressed throughout the process of developing a tool for designation of frontier areas was that it be simple to implement and administer for program and policy officials. The Frontier Education Center believes that it has accomplished this with the development of a three element matrix and a very simple scoring system. Each element of the matrix is readily available and verifiable: population density by Census Bureau information and distance/time through maps.

## **Attachments**

Comment Rounds 1-5

Population Statistics by Density Category for the U. S.

1990 U. S. Population Density: Persons Per Square Mile

Consensus Definition Workgroup Members

References

## FRONTIER DEFINITION ROUND 1

\_\_\_\_\_  
Name

\_\_\_\_\_  
State

Thank you for your help with this initial round of developing a frontier definition. Space has been left at each element for you each category.

Please feel free to suggest other categories or attach any materials that you think will help this process.

1. RATIONAL SERVICE AREA					
Is a definition of a service area needed? With the diversity of frontier areas, what would a rational service area look like?	Current Policy	Recommended	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">unimportant</td> </tr> <tr> <td style="text-align: center;">0</td> </tr> </table>	unimportant	0
unimportant					
0					
Radius from what? _____					
Minimum Population ____Region ____State ____County ____Sub-County ____Other _____					
Comments:					

2. POPULATION DENSITY					
Population density has been used in the past. This usage has caused a great deal of debate. Should density be a factor, the only factor, the most heavily weighted factor?	Current Policy	Recommended	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">unimportant</td> </tr> <tr> <td style="text-align: center;">0</td> </tr> </table>	unimportant	0
unimportant					
0					
Comments:					



3. DISTANCE TO SERVICES				
Many people believe that this is a critical element of a definition, although it has been little used in the past.	Current Policy	Recommended	unimportant	
			0	1
			EMS	
Public Health				
Primary Care				
Mental Health				
Substance Abuse				
Specialists				
Community Hospital				
Tertiary/Specialized Care				
Long Term Care				
Comments:				

4. TRAVEL TIMES and/or TRAVEL CONDITIONS				
Frontier residents raise this as an important consideration. Can it be reflected in a policy?	Current Policy	Recommended	unimportant	
			0	1
			Geography	
Weather				
Road Conditions				
Availability of Public Transportation				
Comments:				

5. HEALTH STATUS				
	Current Policy	Recommended	unimportant	
			0	
Low Birth Weight/Infant Mortality				
Diabetes				
Asthma				
HIV/AIDS				
Other Chronic Disease				
Cancer				
Other Key Indicators				
<b>HAZARDOUS OCCUPATIONS</b>				
Mining				
Forestry				
Other				
Comments:				

6. DEMOGRAPHICS				
	Current Policy	Recommended	unimportant	
			0	
% POPULATION < 18				
% POPULATION > 65				
% POVERTY				
% MINORITY				
<b>SPECIAL POPULATIONS</b>				
Migrant and Seasonal				
Native American				
Comments:				

Please return completed Round 1 form by **November 1, 1997** to:

Mary Visarraga (505) 689-2329 fax or

**Frontier Education Center  
PO Box 98**

**Ojo Sarco, NM 87550**

**FRONTIER DFEFINITION  
ROUND 2**

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Name

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State


Thank you for your help with this second round of developing a frontier definition. Please review the Round 1 Summary then rank the following sections. Please call should you have any questions.


1. RATIONAL SERVICE AREA											
unimportant					→						most important
0	1	2	3	4	5	6	7	8	9	10	
Comments:											

2. POPULATION DENSITY											
unimportant					→						most important
0	1	2	3	4	5	6	7	8	9	10	
Comments:											

3. DISTANCE TO SERVICES											
unimportant					→						most important
0	1	2	3	4	5	6	7	8	9	10	
Comments:											

4. TRAVEL TIMES and/or TRAVEL CONDITIONS										
unimportant  most important										
0	1	2	3	4	5	6	7	8	9	10
Comments:										

5. HEALTH STATUS										
unimportant  most important										
0	1	2	3	4	5	6	7	8	9	10
Comments:										

6. DEMOGRAPHICS										
unimportant  most important										
0	1	2	3	4	5	6	7	8	9	10
Comments:										

Please return completed Round 2 form by **January 5, 1998** to:

Mary Visarraga (505) 689-2329 fax

**Frontier Education Center  
PO Box 98**

**Ojo Sarco, NM 87550**

**FRONTIER DFEFINITION  
ROUND 3**

Name: \_\_\_\_\_

Three methods of defining Frontier have emerged. Please let us know what system you would prefer.

**1. Matrix System**

Weight all choices using scoring system of 1 being least important and 5 being most important.

**SCORING FRONTIER AREAS**

Does there need to be a "rational" service area? Weight the importance of this variable.

<b>Rational Service Area</b>	<b>Jurisdiction</b>
weight 1 → 5	___ State ___ County ___ Regional
	Other (name) _____

Is a jurisdiction needed? If yes, which jurisdiction do you recommmer

Indicate your choice of number of people per square mile upper limit in population density

	Weight 1 → 5
<b>A. Population Density</b> # per sq mi upper limit _____	
<b>B. Distance to Services</b> ___ number of miles	
<b>C. Travel Times &amp; Conditions (geographic/climatic)</b> ___ number of minutes	

For example, show 100% of the weight in A. Population Der or 80% there and in B. Distance to Services

This criteria is used to determine resource allocation among frontier areas.

<b>Resource Allocations and Prioritization of Frontier Areas</b>	
	Weight 1 → 5
<b>Health Status</b>	
<b>Demographics</b>	
<b>Other Name:</b>	



Use this space for your comments:

**2. Service Area Definition by Radius and Density**

This option is based on the methodology proposed by David Rollason. This may be the most useful for the definition of regional, sub-state and sub-county frontier areas. (see attached paper from David Rollason)

Density	Radius	Population
6/sq. mile	50 miles	≤ 47124

Use this space for your comments:

**3. DESIGNATION OF FRONTIER STATES**

Enclosed in this packet of materials is a document from the Frontier Mental Health Services Resource Network discussing the concept of Frontier States. Please refer to this document.

For example, applying a density of 16 persons or less per square mile statewide might qualify the entire state as frontier. This would apply to eight states: North Dakota, South Dakota, Montana, Idaho, Wyoming, New Mexico, Nevada and Alaska. Other states with the majority frontier but having one or two urban areas are excluded using <16 statewide population density. A statewide density of <25 might be more appropriate and adds Nebraska to the list of frontier states.

Use this space for your comments:

Tell us how you would rate the three options using 1 as your least preferred choice and 3 as your best choice. If your preference is for a combination, please comment:

<b>Definition Option</b>	<b>Rating 1 - 3</b>
<b>1. Matrix System</b>	

<b>2. Service Area Definition by Radius and Density</b>	
<b>3. Designation of Frontier States</b>	

Thank you for your participation. Please return Round 3 to us by Fax, no later than **February 13, 1998**. Feel free to call us if you have questions (505) 689-2361.

**FAX TO: Mary Visarraga  
(505) 689-2329**

## Frontier Definition

Round 4

Weighting System for Matrix

Name: \_\_\_\_\_

Total Possible Points 2100

Minimum Frontier = 50

"Extremes" = 50-100

DENSITY	PERSONS PER SQUARE MILE	POINTS
	0-12	50
	12-16	30
	16-20	20
COMMENTS:		

DISTANCE/MILES	PRIMARY CARE POINTS	NEXT/MARKET POINTS
>90 MILES	25	25
60-90	20	20
30-60	15	10
<30	0	0
COMMENTS:		

TIME/MINUTES	PRIMARY CARE POINTS	NEXT/MARKET POINTS
>90 MILES	25	25
60-90	20	20
30-60	15	10
<30	0	0
COMMENTS:		

HOW DID WE DO? (check one) This is It\_\_\_\_ Close\_\_\_\_ You Blew It\_\_\_\_

Please return Round 4 by fax no later than March 6, 1998. Fax to Mary Visarraga 505-689-2329

**Frontier Definition**  
**Round 5**  
**MATRIX AND WEIGHTING OF FRONTIER AREAS**

Items on which there is a clear consensus are indicated as bullets (•).

**PURPOSE**

- To recommend a definition of "frontier" which has multiple applications, an economic development model, not just a health care model.
- Frontier = frontier. Health status and demographics relate to resource allocations, not the definition.

**FOR EXAMPLE:**

- + Some communities will meet the definition for a combination of density, distance, and time, none of which are extreme outliers.
- + Other communities will meet the definition with a higher population density but have an extreme outlier, such as distance of 100 miles or more to a market.
- States, facilities, or communities can apply for designation as frontier. As in MUA designation, states' Executive Branch can appear and/or seek waivers based on local conditions.
- Real issue of frontier is limited, fragile, or no infrastructure.

**RATIONAL SERVICE AREA**

- There needs to be a defined service area.

A community should be involved in the description of the service area.

A "market" can/should be defined very loosely. It could be the location of a high school, does not need to be health care.

Must have the capability to support at least a minimal infrastructure for providing a service.

- Whenever possible, a service area should be within a jurisdiction. These can be flexible and as varied as a county, sub-county, regional planning or economic development district, school district, etc. (Rationale: the system is organized around jurisdictions whether we like it or not.)

**The MATRIX**

Population Density – Distance – Time

**POPULATION DENSITY**

- Can go as high as  $\leq 20$  depending on the presence of outliers (extremes) on either or both of the other categories. (Rationale: little national impact, less than 2% increase in total population.)

**DISTANCE**

- To Primary Care

Stick to the current national standard of 30 miles, at least as a goal.

- To Next Level of Care or Services (when not talking about health care, i.e. to a "market") 50 miles

**TIME**

- To Primary Care

Stick to current national standard of 30 minutes, at least as a goal.

- To Next Level of Care or Services (when not talking about health care, i.e. to a "market") 60 minutes

**Frontier Decision**

Round 5

1. DENSITY

Decision: Is it necessary to have a denominator so that resources of adjacent areas are not masked by the weight of low population density within a county?

Discussion

PRO – a denominator is needed. A blocking concern was raised that parts of a frontier county might be close to an urban area in an adjacent country. (See attached letter from David Rollason

CON – a denominator is not needed for the universal definition of frontier. The impact of adjacent resources only comes into play when considering the allocation of resources to the frontier area. Demographics, health status and other considerations are also part of the eligibility for resources.

DECISION:

\_\_\_\_\_ population density is OK as described in Round 4 (last round)

\_\_\_\_\_ a denominator is needed. I suggest the following methodology \_\_\_\_\_

---

2. DISTANCE

A group member felt that extremes of distance and time should be given more weight. It was suggested that more weight be provided to locations >90 miles to services. This member believes that a distance that great should be equal to low population density, 50 points. The member believes that it is better to take points from the 0-12 density to add them to the extreme distance variable.

DECISION:

\_\_\_\_\_ leave the matrix score as was presented in Round 4

\_\_\_\_\_ modify the distance score in the following manner \_\_\_\_\_

---

3. TIME

DECISION:

\_\_\_\_\_ Time should be based on usual, or average time.

\_\_\_\_\_ Time outliers – seasonal, other – need to be considered using the following

methodology \_\_\_\_\_

\_\_\_\_\_ **My vote is to accept the matrix.**

-----  
comments

\_\_\_\_\_  
name

date

**Fax to Mary Visarraga (505) 689-2329**

**Frontier Definition - Round 6**

NOTE: The changes suggested are **bold**.

Total Possible Points 100

Minimum Points Necessary for Frontier Designation = 50

"Extremes" = 50-100

<b>DENSITY</b>	<b>PERSONS PER SQUARE MILE</b>	<b>POINTS</b>
	0-12	<b>45</b>
	12.1-16	<b>30</b>
	16.1-20	<b>20</b>

<b>DISTANCE/MILES</b>	<b>TO PRIMARY CARE</b>	<b>TO NEXT LEVEL OF SERVICE/MARKET</b>
>90 MILES	25	<b>30</b>
60-90	20	20
30-60	15	10
<30	0	0

<b>TIME/MINUTES</b>	<b>TO PRIMARY CARE</b>	<b>TO NEXT LEVEL OF SERVICE/MARKET</b>
>90 Minutes	25	<b>30</b>
60-90	20	20
30-60	15	10
<30	0	0

(check one) This is ok  This is better  This is worse



Comments:

---

name

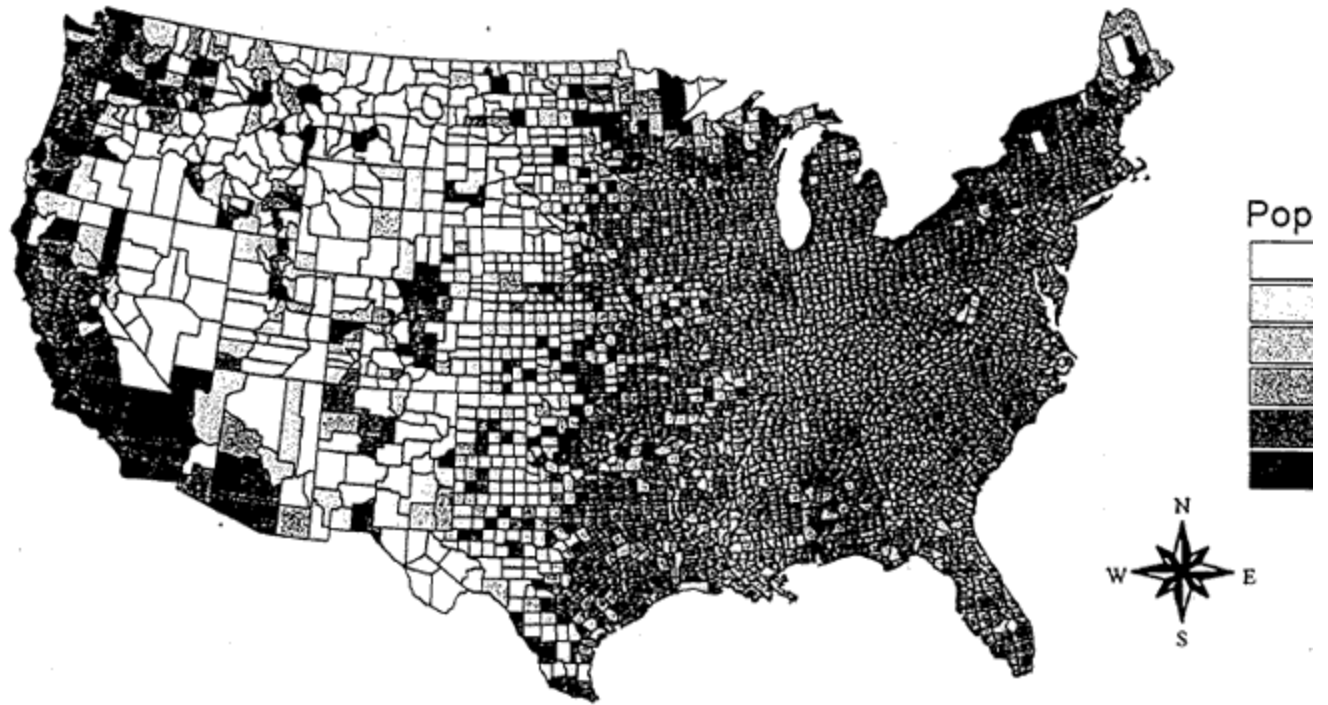
**Please return by fax no later than April 3, 1998 to Mary Visarraga 505-689-2329**

## Population Statistics by Density Category for the U.S.

Source: 1990 U.S. Census Data

<u>Population Density</u> <u>Persons Per Sq Mile</u>	<u>% of Population</u>	<u># of Counties</u>	<u>1990 Population</u>	<u>Cumu</u>
0.01 - 6.00	.009 <1%	409	2,385,319	2,
6.01 - 10.00	.017 <2%	171	1,978,490	4,
10.01 - 12.00	.020 2%	72	883,185	5,
12.01 - 16.00	.028 <3%	140	2,060,751	7,
16.01 - 20.00	.038 <4%	<u>158</u>	<u>2,567,974</u>	9,
<b>Sub-Total</b>		<b>950</b>	<b>9,875,719</b>	
>20.00			<u>248,811,810</u>	
<b>TOTAL</b>			<b>258,687,529</b>	

# 1990 U.S. Population Density Persons Per Square Mile



**Frontier Education Center  
Definition Development Work Group**

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Tom Robertson, Montana

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Mary Sanchez-Bane, Texas

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Jerry Coopey, *ex officio*, Maryland

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Popper, Deborah and Frank Popper, "The Reemergence of the American Frontier," Studies in History and Contemporary Culture, forthcoming.

Goldberg, Carey, "Alaska Revels in Frontier Image Though Frontier Slips Away," New York Times, August 14, 1997

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Elison, Gar, "Frontier Ares: Problems for Delivery of Heath Care Services," Rural Health Care, National Rural health Association, September/October 1986

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- Boards of Nursing Approve Proposed Language for an Interstate Compact for a Mutual Recognition Model of Nursing Regulation, December, 1997
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- Boards of Nursing Proposed Interstate Compact for a Mutual Recognition Model of Nursing Regulation

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## MAPS

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Satellite Image of the United States at Night, Mark Gottdiener, The New Urban Sociology (New York, 1994)

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Population Growth Outside Metropolitan Areas, 1990-1996, New York Times, November 23, 1997

1990 U. S Population Density: Persons Per Square Mile, Doug Clark, University of Denver for Frontier Education Center, Ojo Sarco, New Mexico, February 1998

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