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POPULAR MONTANA INTERACTIVE WEB MAP SERVICES

- Montana GIS Clearinghouse (Montana State Library)
    - http://nris.mt.gov/gis/ (Clearinghouse Home Page)
    - http://apps.msl.mt.gov/Geographic_Information/Data/DataList/
- Montana Dept of Commerce (CEIC)
    - http://ceic.mt.gov/Maps/InteractiveMapsIndex.aspx
- Montana Site Selector
    - http://www.montanasiteselector.com/

- Montana Fish, Wildlife and Parks
  - http://fwp.mt.gov/doingBusiness/reference/maps/ (All MDFWP maps)
  - http://fwp.mt.gov/gis/maps/caps/ (CAPS – Terrestrial and Aquatic Web Maps)
- Montana Traveler Information Map
  - http://roadreport.mdt.mt.gov/map/
- Montana Broadband Internet Map
  - http://mtbroadband.org/interactive-broadband-map/
- Montana Dept of Environmental Quality
  - http://svc.mt.gov/deq/wmadst

ARCGIS.COM WEB TRAINING RESOURCES AND ASSISTANCE
- Vibrant Futures
  - http://www.vibrantfuturesmt.org
- Esri Resource Center Help and Training for ArcGIS.com
  - http://resources.arcgis.com/en/help/arcgisonline/index.html#//010q00000003000000
- CEIC Training
  - http://ceic.mt.gov/Maps/TrainingArcGISonline.aspx
- Geodata Services, Inc. Map Coop
  - http://www.mapcoop.com

MASTER TOWNSHIP FILE

Many of the web maps include the master Vibrant Futures township map layer. A township is a 6 x 6 mile land area formed of the public land survey system. There are 36 sections (1x1 mile) in each township. These formed one of the units of measurement for the Vibrant Futures analysis of the region.

For each township, there were approximately 300 attributes measured for sustainability indicators. You could think of the attributes as columns in a spreadsheet. Each row is a township composed of 300 columns of information to describe its characteristics. Typically one of these attributes are shown on any web map, but all attributes are available to view and analyze within the arcgis.com map viewer.

Each attribute is denoted by a letter abbreviation. We provide a key to relate the abbreviation with its attribute and to describe the attribute. Why is that important? Many of the data were derived or averaged from other map layers, such as census block groups or zip codes. Those include the AC, AP, and AA type variables. We used Esri census block neighborhood apportionment to adjust those variables.

Others were directly counted from points or linear miles of lines. It is particularly important to distinguish counts from percentages, especially in rural areas. Many of the count variables are population or housing based and, if they are not normalized by the total population, interpreting results can be misleading.

KEY TO DATA ATTRIBUTE TYPE
AC - Average per analysis unit processed as a count
AP - Average per analysis unit processed as a percentage or indexed value .01 – 1
AA - Average per analysis unit processed as an average value
ACD - Average of cost distance (Note – these are calculated as a function of distance via highway and road for all state and federal highways in feet (all other values using 2 mph average walking speed) multiplied by a speed limit index and averaged across the township.)
C - Count of features in each township
P - Percent
S - Sum of miles
M- Max number per township

When using the table below, refer to the "Final DB Attribute," which identifies the column headers in the table for each of the 300 attributes. A brief description of what these mean is included in each table along with a data source. Please refer to the detailed documentation for each source for further literature on the data, its origin, and other important information to assist you in using the map data.

DESCRIPTION	Final DB Attribute	TYPE	CATEGORY	SOURCE
Abandoned Mines	ABANDMINE	C	ENVIRONMENT	MT DEQ
US Census American COMMUNITY Survey Wrkrs/Transp: Bicycle	ACSBICYCLE	AC	TRANSPORTATION	BA
US Census American COMMUNITY Survey Wrkrs/Transp: Bus	ACSBUS	AC	TRANSPORTATION	BA
US Census American COMMUNITY Survey Wrkrs/Transp: Carpooled	ACSCARPOOL	AC	TRANSPORTATION	BA
US Census American COMMUNITY Survey Wrkrs/Transp: Drove Alone	ACSDRALONE	AC	TRANSPORTATION	BA
US Census American COMMUNITY Survey Wrkrs/Transp: Motorcycle	ACSMCYCLE	AC	TRANSPORTATION	BA
US Census American COMMUNITY Survey Wrkrs/Transp: Other Means	ACSOTHTRAN	AC	TRANSPORTATION	BA
US Census American COMMUNITY Survey Wrkrs: Publ Transp to Work	ACSPUBTRAN	AC	TRANSPORTATION	BA
US Census American COMMUNITY Survey Wrkrs/Transp: Railroad	ACSRAILRD	AC	TRANSPORTATION	BA
US Census American COMMUNITY Survey Wrkrs/Transp: Taxicab	ACSTAXICAB	AC	TRANSPORTATION	BA
ACS Wrkrs: Transp to Work Base	ACSTRANBAS_C	AC	TRANSPORTATION	BA
2005-2009 ACS Workers Age 16 Years or Older by Travel Time to Work	ACSTRAVTIME	AC	ECONOMIC	BA
ACS Wrkrs/Transp: Walked	ACSWALKED	AC	TRANSPORTATION	BA
ACS Wrkrs 16+: Worked at Home	ACSWRKHOME	AC	TRANSPORTATION	BA
Total Population 70+ 2010	AGEDPOP	AC	HEALTH	BA

Air Quality Non-Attainment Areas	AIRQNAA	C	ENVIRONMENT	MT DEQ/USFS
Pop-1 Race: American Indian 2010	AMERIND10	AC	COMMUNITY	BA
Number of Assisted Living facilities	ASSTLIV	C	HEALTH	MDPHHS
Number of Beds in Assisted Living facilities	ASSTLIVBED	C	HEALTH	MDPHHS
Average Annual Precipitation 1980-2010	AVGANPRECP	AA	AGRICULTURE	MT DEQ
Average household rent	AVGHHRENT	AA	HOUSING	BA
Average household size	AVGHHSIZE	AA	HOUSING	BA
Average Home Value	AVGHUVALUE	AA	HOUSING	BA
Percent of residential structures with potential access to broadband at home	BBACCESS	P	ECONOMIC	MT DOA
Percentage of residential structures with moderate to high speed internet availability	BBHIGHSPD	P	ECONOMIC	MT DOA
Number of Civic & Social Organizations	CIVORG_CNT	AC	COMMUNITY	BA
Crop Alfalfa	CROPALF	P	AGRICULTURE	USDA CropScape
Crop Alfalfa Non-Hay	CROPALFNH	P	AGRICULTURE	USDA CropScape
Crop Barley	CROPBARLEY	P	AGRICULTURE	USDA CropScape
Crop Duram Wheat	CROPDURWH	P	AGRICULTURE	USDA CropScape
Crop Fallow	CROPFALLOW	P	AGRICULTURE	USDA CropScape
Crop Lentils	CROPLENT	P	AGRICULTURE	USDA CropScape
Crop Spring Wheat	CROPSPRWH	P	AGRICULTURE	USDA CropScape
Proximity to Dams	DAMS	ACD	ENVIRONMENT	NRIS
Day Use Recreation Areas	DAYUSEREC	C	ENVIRONMENT	SAWG
Number of dentists	DENTISTS	C	HEALTH	BA
Dispersed Forest Recreation	DISPFREC	C	ENVIRONMENT	SAWG
Number of employees by NAICS classification -Agriculture, Forestry, Fishing and Hunting	E11AGR	C	ECONOMIC	BA
Number of businesses by NAICS classification -Mining	E21MINING	C	ECONOMIC	BA
Number of employees by NAICS classification -Utilities	E22UTIL	C	ECONOMIC	BA
Number of businesses by NAICS classification -Construction	E23CONSTR	C	ECONOMIC	BA
Number of businesses by NAICS classification -Manufacturing	E3133MANUF	C	ECONOMIC	BA
Number of businesses by NAICS classification - Wholesale Trade	E42WHTRADE	C	ECONOMIC	BA
Number of businesses by NAICS classification -Retail Trade	E4445RET	C	ECONOMIC	BA
Number of businesses by NAICS classification -Transportation and Warehousing	E4849TRANS	C	ECONOMIC	BA
Number of businesses by NAICS classification -Information	E51INFORM	C	ECONOMIC	BA
Number of businesses by NAICS classification -Finance and Insurance	E52FINANCE	C	ECONOMIC	BA
Number of businesses by NAICS classification -Real Estate Rental and Leasing	E53REALEST	C	ECONOMIC	BA
Number of businesses by NAICS classification -Professional, Scientific, and Technical Services	E54PROF	C	ECONOMIC	BA

Number of businesses by NAICS classification -Management of Companies and Enterprises	E55MGMT	C	ECONOMIC	BA
Number of businesses by NAICS classification -Administrative and Support and Waste Management and Remediation Services	E56WASTE	C	ECONOMIC	BA
Number of businesses by NAICS classification - Educational Services	E61EDUC	C	ECONOMIC	BA
Number of businesses by NAICS classification - Health Care and Social Assistance	E62HEALTH	C	ECONOMIC	BA
Number of businesses by NAICS classification - Arts, Entertainment, and Recreation	E71ARTS	C	ECONOMIC	BA
Number of businesses by NAICS classification - Accommodation and Food Services	E72ACCOMN	C	ECONOMIC	BA
Number of businesses by NAICS classification - Other Services (except Public Administration)	E81SERV	C	ECONOMIC	BA
Number of businesses by NAICS classification - Public Administration	E92PUBAD	C	ECONOMIC	BA
Alcoholic Beverages:Avg Expend	EALCOHOL	AA	ECONOMIC	BA
All Energy Expend	EALLENERGY	AA	LOCAL SERVICES	BA
All Service Expend	EALLSERV	AA	LOCAL SERVICES	BA
All Transportation and Service Expend	EALLTRSERV	AA	LOCAL SERVICES	BA
Annual Budget Exp:Avg Expend	EANNUALBGT	AA	ECONOMIC	BA
Apparel & Services:Avg Expend	EAPPAREL	AA	ECONOMIC	BA
Bottled Gas:Avg Expend	EBOTGAS	AA	ENERGY	BA
Gas - Bottled/Tank (Owner):Avg Expend	EBOTGASOWN	AA	ENERGY	BA
Gas - Bottled/Tank (Renter):Avg Expend	EBOTGASRENT	AA	ENERGY	BA
Gas-Bottled/Tank(Vac Homes):Avg Expend	EBOTGASVAC	AA	ENERGY	BA
Average annual expenditures for child care	ECHILDCARE	AA	ECONOMIC	BA
Coal/Wood/Other Fuel: Average Expend	ECOALWOOD	AA	ENERGY	BA
Dairy Products:Avg Expend	EDAIRY	AA	ECONOMIC	BA
Percent of Population achieved Post-secondary education	EDGTK12	AP	LOCAL SERVICES	BA
Education:Avg Expend	EEDUC	AA	ECONOMIC	BA
Elec (Owned Vacation Homes):Avg Expend	EELECOVAC	AA	ENERGY	BA
Electricity (Owner):Avg Expend	EELECOWN	AA	ENERGY	BA
Electricity (Renter):Avg Expend	EELECRENT	AA	ENERGY	BA
Elec (Rented Vacation Homes):Avg Expend	EELECRVAC	AA	ENERGY	BA
Electricity:Avg Expend	EELECTRIC	AA	ENERGY	BA
Entertainment/Recreation:Avg Expend	EENTREC	AA	ECONOMIC	BA
Fuel Oil (Own&Own Vac Home): Avg Expend	EFOILOWN	AA	ENERGY	BA
Fuel Oil (Renter): Average Expend	EFOILRENT	AA	ENERGY	BA
Food:Avg Expend	EFOOD	AA	ECONOMIC	BA
Food Away from Home:Avg Expend	EFOODAWAY	AA	ECONOMIC	BA
Fuel Oil: Average Expend	EFUELOIL	AA	ENERGY	BA
Health Care:Avg Expend	EHEALTHCAR	AA	HEALTH	BA
Household Operations:Avg Expend	EHOUSEOPP	AA	HOUSING	BA
Housekeeping Supplies:Avg Expend	EHOUSESUP	AA	ECONOMIC	BA
Housing:Avg Expend	EHOUSING	AA	HOUSING	BA

Life/Other Insurance:Avg Expend	EINSURANCE	AA	ECONOMIC	BA
Investments:Avg Expend	EINVEST	AA	ECONOMIC	BA
Meat/Poultry/Fish/Eggs:Avg Expend	EMPFEGGS	AA	ECONOMIC	BA
Number of police sheriff employees from NAICS	EMPLAWENF	AC	LOCAL SERVICES	BA
Natural Gas:Avg Expend	ENATGAS	AA	ENERGY	BA
Natural/Utility Gas (Rent):Avg Expend	ENATGASOWN	AA	ENERGY	BA
Natural/Utility Gas (Owner):Avg Expend	ENATGASREN	AA	ENERGY	BA
Nat/Utility Gas (Vac Homes):Avg Expend	ENATGASVAC	AA	ENERGY	BA
Nonalcoholic Beverages:Avg Expend	ENONALC	AA	ECONOMIC	BA
Health Hazards Exposure from HUD FHEA Index	ENVIRONHUD	AA	HEALTH	HUD
Own Mats for Insulation/Oth:Avg Expend	EOWNMAT	AA	ENERGY	BA
Personal Care Prod & Services:Avg expend	EPERSCARE	AA	ECONOMIC	BA
Smoking Products:Avg Expend	ESMOKE	AA	ECONOMIC	BA
Snacks/Other Food:Avg Expend	ESNACK	AA	ECONOMIC	BA
Diesel Fuel:Avg Expend	ETDIESEL	AA	TRANSPORTATION	BA
Gasoline:Avg Expend	ETGAS	AA	TRANSPORTATION	BA
Gasoline & Motor Oil:Avg Expend	ETGASOIL	AA	TRANSPORTATION	BA
Car/Van Pool & Non-motor Trans:Avg Expend	ETPOOLNM	AA	TRANSPORTATION	BA
Public/Other Transportation:Avg Expend	ETPUBLIC	AA	TRANSPORTATION	BA
Transportation:Avg Expend	ETRANS	AA	TRANSPORTATION	BA
Travel:Avg Expend	ETRAVEL	AA	ECONOMIC	BA
Utilities/Fuel/Public Serv:Avg Expend	EUTILFUELP	AA	ENERGY	BA
Water & Oth Public Services:Avg Expend	EWATERP	AA	LOCAL SERVICES	BA
Water & Sewer Maintenance:Avg Expend	EWATERSEWER	AA	LOCAL SERVICES	BA
Water/Sewer Maint (Owner):Avg Expend	EWATSEWOWN	AA	LOCAL SERVICES	BA
Water/Sewer Maint (Renter):Avg Expend	EWATSEWRENT	AA	LOCAL SERVICES	BA
Water/Sewer Maint(Vac Homes):Avg Expend	EWATSEWVAC	AA	LOCAL SERVICES	BA
Family Population 2010	FAMPOP_CY	AC	COMMUNITY	BA
FLU Agricultural Lands	FLU_AG	P	AGRICULTURE	MT DOR
Percentage of agricultural land with wireless broadband capability	FLU_AG_MW	P	AGRICULTURE	MT DOA
FLU Continuously cropped	FLU_C	P	AGRICULTURE	MT DOR
FLU Summer fallow farmland	FLU_F	P	AGRICULTURE	MT DOR
FLU Grazing land	FLU_G	P	AGRICULTURE	MT DOR
FLU Non-irrigated hay land	FLU_H	P	AGRICULTURE	MT DOR
FLU Pivot irrigation	FLU_IP	P	AGRICULTURE	MT DOR
FLU Sprinkler irrigation	FLU_IS	P	AGRICULTURE	MT DOR
FLU Non-commercial forest land	FLU_N	P	AGRICULTURE	MT DOR
FLU Forest land	FLU_T	P	AGRICULTURE	MT DOR
Residential Heating Fuel Type Coal	FUELCOAL	C	ENERGY	MT DOR
Residential Heating Fuel Type Electricity	FUELELEC	C	ENERGY	MT DOR
Residential Heating Fuel Type Gas	FUELGAS	C	ENERGY	MT DOR

Residential Heating Fuel Type Geothermal	FUELGEO	C	ENERGY	MT DOR
Residential Heating Fuel Type Oil	FUELOIL	C	ENERGY	MT DOR
Residential Heating Fuel Type Solar	FUELSOLAR	C	ENERGY	MT DOR
Residential Heating Fuel Type Wood	FUELWOOD	C	ENERGY	MT DOR
Number of historic gas wells other	GASWELLOTH	C	ENERGY	BOGC/DNRC
Number of producing gas wells	GASWELLPROD	C	ENERGY	BOGC/DNRC
Group Quarters Population Military 2010	GQMIL10	AC	HOUSING	BA
Group Quarters Population 2010	GQPOP10	AC	HOUSING	BA
Number of gravel permitted sites	GRAVELSITE	C	LOCAL SERVICES	MT DEQ
Household Population 2010	HHPOP_CY	AC	COMMUNITY	BA
Total Hospital Beds	HOSPBEDS	C	HEALTH	DPHHS
Combined Housing and Transportation Affordability - Proportion of consumer expenditures on housing and transportation costs out of median family income	HOTRAFFORD	P	HOUSING	BA
Percent of population age 25+ highest grade attained was high school	HSGRAD	AP	ECONOMIC	BA
Number of population highest grade achieved is high school	HSGRADHGA	AC	COMMUNITY	BA
Housing affordability index	HUAFFORD	AP	HOUSING	HUD
HUD30	HUD30PCT	AP	HOUSING	BA / HUD
HUD50	HUD50PCT	AP	HOUSING	BA / HUD
HUD80	HUD80PCT	AP	HOUSING	BA / HUD
HUD FHEA Housing Units 2010	HUHUD	AC	COMMUNITY	HUD
Percent of vacant housing units migrant workers 2011	HUMIGWKR	AP	HOUSING	BA
Hunter and Angler Valued Areas	HUNTFISH	AC	ENVIRONMENT	TRCP
Percent of owner occupied housing units 2011	HUOWN	AP	HOUSING	BA
Number of housing units by year built before 1970 (legislation for mobile home standards, and approximate year lead paint was prohibited)	HUPRE70	C	ENERGY	MT DOR
Number of renter occupied housing units 2011	HURENT	AP	HOUSING	BA
Number of vacant housing units 2011	HUVACANT (HUVACANTNO)	AP	HOUSING	BA
Number of vacant housing units seasonally occupied 2011	HUVACANTSO	AP	HOUSING	BA
Impervious Surfaces	IMPERVIOUS	P	ENVIRONMENT	USGS
Insect & Disease for All Species Except Bark Beetles	INSDISALLS	P	ENVIRONMENT	DNRC SAP
Irrigation Ditches	IRRGDITCH	S	AGRICULTURE	DNRC
Job Accessibility from HUD FHEA Index	JOBACCESHUD	AP	ECONOMIC	HUD
Labor Market Engagement from HUD FHEA Index	LABMKTHUD	AP	ECONOMIC	HUD
FLU Flood irrigation	LU_IF	P	AGRICULTURE	MT DOR
Median Household Income 2016	MEDHINC_FY	AA	COMMUNITY	BA
Median HH Income	MHHINC	AA	ECONOMIC	BA
Grwth Rt: Median Household Income 2011-2016	MHIGRWCYFY	AP	ECONOMIC	BA
Number of businesses by NAICS classification -Agriculture, Forestry, Fishing and Hunting	N11AGR	C	ECONOMIC	BA
Number of businesses by NAICS	N21MINING	C	ECONOMIC	BA

classification -Mining				
Number of businesses by NAICS classification -Utilities	N22UTIL	C	ECONOMIC	BA
Number of businesses by NAICS classification -Construction	N23CONSTR	C	ECONOMIC	BA
Number of businesses by NAICS classification -Manufacturing	N3133MANUF	C	ECONOMIC	BA
Number of businesses by NAICS classification - Wholesale Trade	N42WHTRADE	C	ECONOMIC	BA
Number of businesses by NAICS classification -Retail Trade	N4445RET	C	ECONOMIC	BA
Number of businesses by NAICS classification -Transportation and Warehousing	N4849TRANS	C	ECONOMIC	BA
Number of businesses by NAICS classification -Information	N51INFORM	C	ECONOMIC	BA
Number of businesses by NAICS classification -Finance and Insurance	N52FINANCE	C	ECONOMIC	BA
Number of businesses by NAICS classification -Real Estate Rental and Leasing	N53REALEST	C	ECONOMIC	BA
Number of businesses by NAICS classification -Professional, Scientific, and Technical Services	N54PROF	C	ECONOMIC	BA
Number of businesses by NAICS classification -Management of Companies and Enterprises	N55MGMT	C	ECONOMIC	BA
Number of businesses by NAICS classification -Administrative and Support and Waste Management and Remediation Services	N56WASTE	C	ECONOMIC	BA
Number of businesses by NAICS classification - Educational Services	N61EDUC	C	ECONOMIC	BA
Number of businesses by NAICS classification - Health Care and Social Assistance	N62HEALTH	C	ECONOMIC	BA
Number of businesses by NAICS classification - Arts, Entertainment, and Recreation	N71ARTS	C	ECONOMIC	BA
Number of businesses by NAICS classification - Accommodation and Food Services	N72ACCOMN	C	ECONOMIC	BA
Number of businesses by NAICS classification - Other Services (except Public Administration)	N81SERV	C	ECONOMIC	BA
Number of businesses by NAICS classification - Public Administration	N92PUBAD	C	ECONOMIC	BA
Number of employees by NAICS classification	NAICSEMP	C	ECONOMIC	BA
Number of NAICS categories represented in a town (diversity and resiliency)	NAICSSUM	C	ECONOMIC	BA
Number of historic oil wells other	OILWELLOTH	C	ENERGY	BOGC/DNRC
Number of producing oil wells	OILWELLPROD	C	ENERGY	BOGC/DNRC
Owner Occupied Housing Units Mortgage 2010	OOMORT10	AC	HOUSING	BA
Owner Occupied Housing Units No Mortgage 2010	OONOMORT10	AC	HOUSING	BA
Public Overnight Recreation Areas	OVERNREC	AC	ENVIRONMENT	SAWG
Owner Occupied Housing Units 2010	OWNER_CY	AC	HOUSING	BA
Owner Occupied Housing Units 2010	OWNER10	AC	HOUSING	BA
Proximity to Airports	PAIRPORT	ACD	LOCAL SERVICES	USGS
Proximity to Bountiful Baskets pick-up location	PBOUNTIFUL	ACD	HEALTH	BountifulBAskets
Proximity to Civil & Social Organizations	PCIVORG	ACD	COMMUNITY	BA
Proximity to County Seat	PCNTYSEAT	ACD	LOCAL SERVICES	NRIS
Percentage 2010 Family Population	PCTFAMILY	AP	COMMUNITY	BA
Proximity to Hydroelectric Dams	PDAMS_H	ACD	ENERGY	NRIS

Proximity to Dentists	PDENTIST	ACD	HEALTH	BA
Proximity to employment center	PEMPCNTR	ACD	ECONOMIC	BA
Proximity to Finance Institutions	PFINANCE	ACD	ECONOMIC	BA
Proximity to Fitness Centers	PFITNESS	ACD	HEALTH	BA
Proximity to Establishment that buys or sells local food	PFOODPROD	ACD	AGRICULTURE	MT DEPT AG
Proximity to gas station	PGAS	ACD	ENERGY	BA
Proximity to Grain Elevators	PGRAINELEV	ACD	AGRICULTURE	MT DEPT AG
Proximity to gravel permitted sites	PGRAVELSITE	ACD	LOCAL SERVICES	DEQ
Proximity to Health Care Establishments	PHEALTHEST	ACD	HEALTH	BA
Proximity to Hospitals	PHOSPITALS	ACD	HEALTH	BA
Number of primary care physicians	PHYSICIANS	C	HEALTH	MT DPSHHS
Proximity to Active Landfills	PLFACTIVE	ACD	LOCAL SERVICES	DEQ
Proximity to Closed Landfills	PLFCLOSED	ACD	ENVIRONMENT	DEQ
Proximity to Library	PLIBRARY	ACD	LOCAL SERVICES	NRIS
Total Population 65-69 2010	POP65_CY	AC	HEALTH	BA
Total Population 65+ 2010	POP65PLUS	AC	HEALTH	BA
Grwth Rt: Population 2000-2010	POPGRW0010	AP	ECONOMIC	BA
Proximity Outdoor Recreation All	POUTDOOREC	ACD	TRANSPORTATION	SAWG
Poverty from HUD FHEA Index	POVERTYHUD	AP	HOUSING	HUD
Proximity to Restaurants	PPRESTAURANT	ACD	ECONOMIC	BA
Proximity to Justice & Public Safety	PPUBSF	ACD	LOCAL SERVICES	BA
Proximity to All DEQ Remediation Sites	PREMED	ACD	ENVIRONMENT	DEQ
Private Overnight Recreation Areas	PRIVREC	C	ENVIRONMENT	BA
Proximity to Schools College	PSCHCOLLEGE	ACD	LOCAL SERVICES	NRIS
Proximity to Schools Grade School	PSCHGRADE	ACD	LOCAL SERVICES	NRIS
Proximity to Schools High School	PSCHHIGH	ACD	LOCAL SERVICES	NRIS
Proximity to Schools Middle School	PSCHMIDDLE	ACD	LOCAL SERVICES	NRIS
Proximity to Schools Mixed K-12	PSCHMXK12	ACD	LOCAL SERVICES	NRIS
Proximity to Shuttle Grain Elevators	PSHUTELEV	ACD	AGRICULTURE	MT DEPT AG
Structures Condition Desireability Usefulness (CDU)	PSTRCDU	AC	HOUSING	MT DOR
Proximity to Supermarkets - Fresh Produce	PSUPERMKT	ACD	HEALTH	BA & VF
Proximity to Transit Stops	PTRANSIT	ACD	TRANSPORTATION	VF
Public Lands and Conservation Easements	PUBLANDCE	P	ENVIRONMENT	NRIS/DOR
Count of Justice & Public Safety	PUBSF_CNT	C	LOCAL SERVICES	BA
Public Water Supply	PUBWATER	C	ENVIRONMENT	DEQ
Proximity to Wind Farms	PWINDFARM	ACD	ENERGY	WEB
Miles of gravel road	RDSGRAVEL	C	TRANSPORTATION	MT DOT
Miles of paved roads	RDSPAVED	C	TRANSPORTATION	MT DOT
Recreation Trails	RECTRAILS	S	ENVIRONMENT	USFS
Number of areas with environmental health hazards	REMEDCNT	C	HEALTH	DEQ
Renter Occupied Housing Units 2010	RENTER_CY	AC	HOUSING	BA

Renter Occupied Housing Units 2010	RENTER10	AC	HOUSING	BA
School proficiency from HUD FHEA Index	SCHOOLHUD	AP	COMMMUNITY	HUD
Proximity to Social Service Establishments	SOCIALEST	ACD	HEALTH	BA
Structures All	STRALL	C	HOUSING	MT State Library
Structures Multi-Family	STRMF	C	HOUSING	MT State Library
Structures Multi-Family Pre-1970	STRMFPRE70	C	HOUSING	MT State Library
Structures Mobile Home	STRMH	C	HOUSING	MT State Library
Structures Mobile Home Pre-1970	STRMHPRE70	C	HOUSING	MT State Library
Structures Other	STROTHER	C	COMMUNITY	MT State Library
Structures Single Family	STRSF	C	HOUSING	MT State Library
Structures Single Family Pre-1970	STRSFPRE70	C	HOUSING	MT State Library
Surface Fire	SURFIRE	AP	ENVIRONMENT	SAWG
Average Daily Maximum Temperature	TEMPMAX	AA	AGRICULTURE	MT State Library
Average Daily Minimum Temperature	TEMPMIN	AA	AGRICULTURE	MT State Library
Total Housing Units 2010	TOTHU_CY	AC	HOUSING	BA
Total Housing Units 2010	TOTHU10	AC	HOUSING	BA
Total Population 2010	TOTPOP_CY	AC	COMMUNITY	BA
HUD FHEA Total Population 2010	TPOPHUD	AC	COMMUNITY	HUD
Transit Access from HUD FHEA Index	TRANSHUD	AP	TRANSPORTATION	HUD
Unemployment rate	UNEMPRATE	AA	ECONOMIC	HUD
Public Sewer Percent	UTILSEWER	P	LOCAL SERVICES	MT DOR
Public Sewer Parcel Count	UTILSEWERC	C	LOCAL SERVICES	MT DOR
Public Water Percent	UTILWATER	P	LOCAL SERVICES	MT DOR
Public Water Parcel Count	UTILWATERC	C	LOCAL SERVICES	MT DOR
Vacant Housing Units 2010	VACANT_CY	AC	HOUSING	BA
Vacant Housing Units 2010	VACANT10	AC	HOUSING	BA
Vacant Housing Units Migrant Workers 2010	VACMIGR10	AC	HOUSING	BA
Vacant Housing Units Other Vacant 2010	VACOTHER10	AC	HOUSING	BA
Vacant Housing Units For Rent 2010	VACRENT10	AC	HOUSING	BA
Vacant Housing Units Rented Not Occupied 2010	VACRNTED10	AC	HOUSING	BA
Vacant Housing Units For Sale Only 2010	VACSALE10	AC	HOUSING	BA
Vacant Housing Units Seasonal Occupied 2010	VACSEAS10	AC	HOUSING	BA
Vacant Housing Units Sold Not Occupied 2010	VACSOLD10	AC	HOUSING	BA
Oil and Gas Wells	VFALLWELLS	C	ENERGY	MTBOG
Aquatic Resources	WAQUATIC	AP	ENVIRONMENT	MDFWP
Wells	WELLS	C	AGRICULTURE	MBMG
Pop-1 Race: White 2010	WHITE10	AC	COMMUNITY	BA
Wind Potential	WINDPOTEN	AP	ENERGY	West Gov

Wind Speed	WINDSPEED	AP	ENERGY	West Gov
Terrestrial Wildlife	WTERREST	AP	ENVIRONMENT	MDFWP
Wildland Urban Interface	WUI	P	ENVIRONMENT	DNRC

Demographic and Economic Data

Most of the demographic and economic data we utilized came from Esri Business Analyst and Community Analyst.   These are designated as "BA" in the master spreadsheet data dictionary. The data dictionary includes a column titled "ESRI Attribute" which is the name of the original ESRI attribute matching their documentation. The master township and market town data layers, with the large set of modeled data, include custom descriptive attribute names in the column titled "Final DB Attribute." You must use the spreadsheet data dictionary to do the attribute name crosswalk to look up detailed metadata and documentation on ESRI Business Analyst data. Geodata Services, Inc. maintains a commercial license for Basic ESRI Business Analyst Desktop and an Advanced Pro data license for Esri Community Analyst. The data was derived from the appropriate source based on our commercial licensing. The licensing prohibits distribution of the data in the original format, but we are allowed to provide value-added data to our clients and data that cannot be reverse engineered to show the original data attributes. As a result, the data in original point format or census block group or zip code polygon format was apportioned to townships based on the public land survey system or market towns based on drive time polygons around the towns. The data was apportioned with block apportionment or cascading centroid methods using ESRI Business Analyst. For point layers, all data attributes were erased. In general, to access the demographic and economic data you must use the two master, generalized layers.

This is a regional project.   Our intent in apportioning demographic and economic data to geographic units smaller than counties or census tracts was not to simply generalize the data for distribution but also to apportion it to standard units of analysis that would allow area-to-area comparison across the region. Most data of this type focuses on coarser geographic units, primarily census tracts or counties. The Esri data, primarily derived at the census block group and zip code levels of geography, combined with Esri business point data and ownership parcel and structure at much finer grains, allowed us to develop data at a region scale (townships and 3-9 mile drive time polygons around the 100 towns in the region). Caution should be exercised in interpreting some of the data with low sample size, such as the American Community Survey data at the township or town scale.

The Esri demographic team was led by chief demographer Lynn Wombold. Esri's data development team has a 30-year history of excellence in market intelligence. The combined expertise of the team's economists, statisticians, demographers, geographers, and analysts totals nearly a century.

Extracted descriptions summarizing the major data we used are quoted below from Esri white papers. Much more detail is available from the hotlinks provided below this description in a series of white papers published by Esri.

Esri Business Analyst and Community Analyst is a comprehensive list of approximately 11,000 data attributes derived from census data (1990-2010), American Community Survey. Most data used is mapped at the census block group, census tract, county, or zip code level of geography.

Spending patterns (for instance housing and transportation expenditures) were also derived from Esri data. Esri has combined the latest Consumer Expenditure Surveys (CEX), 2006–2007, from the Bureau of Labor Statistics (BLS) to estimate current spending patterns. Esri has updated the models used to estimate consumer spending with its market segmentation system, Tapestry™. The model that links the spending of consumer units in CEX surveys to all households with similar socioeconomic characteristics is a conditional probability model that integrates consumer spending with Tapestry Segmentation. Spending patterns are developed by Tapestry markets and updated to 2011 by adjusting to current levels of income. Expenditures represent the 2011 annual averages and totals.

Esri's 2011 Market Potential data measures the likely demand for a product or service in an area. Esri computes Market Potential by combining 2011 Tapestry™ Segmentation data with Doublebase® 2009 data from GfK MRI. Doublebase 2009 is an integration of information from four consumer surveys. Each survey respondent can be identified by Tapestry segment, so a rate of consumption by Tapestry segment can be determined for a product or service for any area.

Esri continues to leverage and build on its years of analytic insight and experience with the 2010 Retail MarketPlace. The database includes the latest market statistics for Retail Trade and Food Services and Drinking Places (the retail market). The dollar estimates, which represent total retail supply and demand conditions for the past year, are presented in the North American Industry Classification System (NAICS). These datasets comprise an update of supply and demand for the 27 industry groups in the Retail Trade sector, NAICS 44–45, as well as the four industry groups within the Food Services and Drinking Places subsector, NAICS 722.

Esri extracts its business data from a comprehensive list of businesses licensed from Infogroup®. This business list contains data for nearly 12 million US businesses—including the business name, location, franchise code, industry classification code, number of employees, and sales volume (expressed in thousands of dollars)—current as of January 2011.

See http://www.esri.com/data/esri_data/methodology-statements for a list of the following detailed publications:

- Esri 2012/2017 Updated Demographics [PDF]
- The American Community Survey [PDF]
- 2011 Methodology Statement: Consumer Expenditure Database [PDF]
- 2011 Methodology Statement: Esri Data—Market Potential [PDF]
- 2010 Methodology Statement: Esri Data—Retail MarketPlace [PDF]
- 2011 Methodology Statement: Esri Data—Business Locations and Business Summary [PDF]
- 2011 Methodology Statement: Diversity Index
- Methodology Statement: Esri Data-Market Potential [PDF]
- Revealing the 'Where' of Business Intelligence using Location Analytics
- Reveal More Value in Your Data with Location Analytics

A detailed blind study comparing US demographic data vendors was recently conducted by several universities. They judged Esri the most accurate data provider in geospatial analysis (http://www.esri.com/~/media/Files/Pdfs/library/brochures/pdfs/vendor-accuracy-study.pdf).

Caution should be used in small area rural estimates such as most of the Vibrant Futures region. We have supplemented the Esri data with detailed parcel and structure counts as well as other state and local data. We also have published web maps for local residents to review and provide comments on the national level data. We encourage all participants to review these data and web maps and provide your own comments. The following excerpts from the Esri methodology (Esri 2012/2017 Updated Demographics [PDF]) summarize some of the key considerations and differences in the evolving US census data collection:

> Gauging economic change in small areas is more challenging in this decade. Census 2010 was a game changer in the development of small area data because it collected no sample data—variables like income, education, employment, and home value. The American Community Survey (ACS) is the replacement for sample data, though the differences from the 2000 census were significant. Single-year ACS is reported for areas with a population of 65,000 or more. Data for all levels is available only as a five year average.

> Unlike census sample data, the American Community Survey represents a series of monthly sample surveys that yield different measures of familiar variables. The differences in measurement include continuous data collection and smaller sample sizes. Naturally, ACS sample sizes are much smaller than a census survey taken once every 10 years. To represent the smallest sample areas—block groups—data must be collected over 60 months. One-year ACS

data is actually a 12-month average rather than a single point in time, April 1.

How does this difference affect the annual demographic updates? Change must be estimated differently now. Esri estimates change from April 1, 2010 (the census base), to July 1, 2012—point estimates. ACS data are period estimates, which include at least 12 months. The differences are pronounced in areas with a seasonal population. The best example of seasonal effects is unemployment rates. ACS does not report *monthly* survey data, but the Bureau of Labor Statistics (BLS) does—both seasonally adjusted and not. The time frame clearly impacts the size of the estimate in areas with seasonal populations. Twelve-month averages smooth the highs and lows; 60-month averages for small areas smooth out all trend lines. There are also methodological differences between ACS and BLS in unemployment estimation. ACS's unemployment estimates tend to be higher.

Although there will be annual releases of ACS data, only five-year data will be reported for small areas. And there will still be missing data. ACS cannot be the sole measure of the population for the next decade any more than a single decennial survey could. There will always be a need for alternative data sources to measure the facets of change—demographic and economic.

The good news is the proliferation of data sources, from administrative records to private data sources. Government agencies continue to provide their data in convenient, digital time series, while the private sector has been pioneering the indirect collection of data from a host of sources, including Internet use and social media. Esri has been using a variety of data sources for years to update small areas like block groups, beginning with the latest census base, then adding a mixture of administrative records, like delivery counts from the US Postal Service, and various private sources, like a comprehensive address file, to capture change to the census base.

This approach has been effective in past updates, but it requires a solid census base and a variety of sources and statistical models to capture change. Demographic updates must incorporate both traditional and new data sources to remain current. The challenge now is to retool forecast models to integrate changing traditional sources and exploit new data sources.

I. **BOUNTIFUL BASKETS - Bountiful Baskets Food Co-op**
   a. Bountiful Baskets locations
   http://www3.bountifulbaskets.org/?page_id=6&state=MT&producttype=BOTH

II. **DEQ - MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY**
   a. Opencut Mining Program – sand and gravel permitted areas were provided in GIS form by the Unit Coordinator, IEMB Opencut, Department of Environmental Quality
   http://www.deq.mt.gov/opencut/default.mcpx

   b. Landfills (MDEQ 1996)
   http://gisportal.msl.mt.gov/geoportal/catalog/search/resource/details.page?uuid=%7BF30D3756-6AF4-404A-AEB0-F93A0FBD7A65%7D

   c. Public Water System Sources
   http://gisportal.msl.mt.gov/geoportal/catalog/search/resource/details.page?uuid=%7BCDC1702D-810F-4055-B956-ED78662BA1F5%7D

   d. Remediation Response Sites Layer
   http://gisportal.msl.mt.gov/geoportal/catalog/search/resource/details.page?uuid=%7BA46E248F-AE6F-4A8C-A7EE-5B293C19B02B%7D

III. **DNRC - MONTANA DEPARTMENT OF RESOURCE CONSERVATION**
   a. Irrigation Ditches
   These data were acquired during 12/10 from Elizabeth Murray, GIS Specialist, Montana DNRC, Water Resources Division, (406) 444 5926,emurray@mt.gov. See link for information associated with surveys from which these data originated. http://www.dnrc.mt.gov/wrd/water_rts/survey_books/default.asp

   b. Wildland Urban Interface
   Healthy Forests Restoration Act - Wildland Urban Interface for Montana & North Idaho. This layer was provided by DNRC.

IV. **HUD – US Department of Housing & Urban Development**

HUD's Office of Sustainable Housing and Communities asked its grant recipients, including this project by Opportunity Link, to complete a Fair Housing Equity Assessment (FHEA). Thee agency is taking a more active role as a dynamic partner by providing more data and analytical tools to help quantify and interpret particular fair housing dynamics. The documents in the HUD_FHEA subfolder in the HUD_Data folder outlines the data, methods, and sources behind the information that HUD is providing. HUD's Office of Policy Development & Research (PD&R) has compiled a

set of neighborhood data and analysis that will be available to program participants to support local planning reports. This document describes the data and analysis, which accompanies three central equity principles: reducing segregation, eliminating racially/ethnically concentrated areas of poverty, increasing access to areas of high opportunity. This data package is by no means exhaustive; use of the data is optional and should not supplant more robust local data or knowledge. It represents a baseline report to assemble consistent, nationally available data from a variety of sources in a single location and provide examples of possible analytical strategies to examine racially-concentrated areas of poverty, segregation and integration, and access to neighborhood opportunity.

We enhanced the HUD data by joining data tables and populating the census block groups GIS layer. All the data and the methodology provided by HUD can be found in the HUD_Data folder.

V.   MBMG - MONTANA BUREAU OF MINES & GEOLOGY
     a. Well Data
http://gisportal.msl.mt.gov/geoportal/catalog/search/resource/details.page?uuid=%7BB40FCBD4-DA34-483A-A8C9-F9C1E95F7A21%7D

VI.   MT DEPT AG - MONTANA DEPARTMENT OF AGRICULTURE
     a. Grain Elevators
   - i. http://agr.mt.gov/agr/Programs/Commodities/DealersWarehouses/pdf/Commodity_License_List_FY2013_01.4.13.pdf
   - ii. http://www.mdt.mt.gov/publications/docs/brochures/railways/railplan.pdf
   - iii. Esri Business Analyst Grain Elevators returned 38 records. Counts and proximity are only available in the township and market towns layers in summarized form. Additional data on grain elevator and shuttle elevators was confirmed through the web site at www.farmnetservices.com/farm/Grain_Elevators/MONTANA_GRAIN_ELEVATORS/63-0.html

     b. Local food producers and purchasers

The local food map includes locations providing fresh produce. This is enhanced with web mapping and the input of local volunteers as well as Vibrant Futures community feedback and, in addition, the knowledge of a partial group of local food producers and consumers developed by the Montana Dept. of Agriculture, AERO, the Montana state Library and other partners.   This information, published by the Montana State Library NRIS as a map service shows what we know about Montana's food establishments and their functions, especially those known to participate in local commerce. State funds for this project were matched with Federal funds under the Federal-State Marketing Improvement Program of the

Agricultural Marketing Service, U.S. Department of Agriculture. See http://www.aeromt.org/2012/08/01/explore-montanas-food-system-maps/ for more information.

VII.   **MT DOR - MONTANA DEPARTMENT OF REVENUE**
  a. Cadastral Data
  http://geoinfo.montanastatelibrary.org/data/msdi/cadastral/

VIII.   **MT DOT - MONTANA DEPARTMENT OF TRANSPORTATION**
  a. Montana MDT Routes
  http://gisportal.msl.mt.gov/geoportal/catalog/search/resource/details.page?uuid=%7B332997D0-B2F7-4B3D-AA27-301856FB5D02%7D

IX.   **MT DPSHHS - MONTANA DEPARTMENT OF PUBLIC HEALTH & HUMAN SERVICES**

Most of the data sources we have used for Montana Healthcare workforce data came from the ***Montana Healthcare Workforce Statewide Strategic Plan***:

In the spring of 2006, the Montana Office of the Commissioner of Higher Education approached the Montana Area Health Education Center (AHEC) and Office of Rural Health, asking the Advisory Board to provide leadership on healthcare workforce issues. The statewide Montana Healthcare Workforce Advisory Committee (MHWAC) was born.

Additional data was derived from draft information prepared for the 2013 Montana legislative session and is available from Montana State University at http://healthinfo.montana.edu/mthwac.html.

Local assistance was also provided by the public health officials in the 11 counties in the Vibrant Futures region.

These data were also supplemented by Esri expenditure data from sources described above. Other sustainability indicators for health include local food sources, fresh produce sources, recreation sites, trails and areas, health facilities and many other factors affecting health and health care. These came from a variety of sources that are indentified in the documentation and metadata on a map layer by layer basis in the detailed data documentation. The following two examples will illustrate this.

Local foods and fresh produce sources:
Supermarkets selling fresh produce were initially derived from Infogroup using NAICS codes. These were reviewed by local community members to eliminate potential mistakes and have been published on an open public web map since October, 2012. Data points and quantities for the Bountiful Baskets program (a non-

profit food distribution program) were geocoded from town locations and addresses on their web site and local contacts. An independent list of all Montana local food producers and consumers, in progress and under development by the Montana Department of Agriculture, AERO (a non-profit group), and the Montana State Library, was also included in this list. Proximity from all these point source locations were measured to every point in the region using the statewide transportation framework layer from the state base map service center (compiled from each county and several state and local agencies and the Montana Department of Transportation state highway map). A calculation of the relative proximity of the nearest local food source to any business or residence in the 11 county region was the result.

Exercise and recreation:
Dispersed recreation points from state, federal and local agencies was compiled for trailheads, fishing access sites, campgrounds, state and national parks, etc. Private outdoor recreation sites from Infogroup and Esri supplemented these. These sources also provided gyms, fitness centers, public pools, and other recreation facilities. These were combined with public land areas derived from the Montana Cadastral system and the public agencies. A complete list of parks, bicycle, and hiking trails was not available for the region, so a public web map has been published since October, 2012 to gather new locations mapped by the public. Although it is incomplete, the data provided additional information, particularly on public parks. Similar to food sources, the proximity via the transportation network to these recreation areas and points was calculated to every point in the region for relative suitability comparisons.

a. Critical Access Hospitals (report)
http://www.dphhs.mt.gov/qad/healthcarefacilitieslist/criticalaccesshospitals.pdf

b. Primary Care Physicians (report)
http://healthinfo.montana.edu/mthwac.html

X. MT STATE LIBRARY

Montana State Library and the Montana Base Map Service Center

The MT State Library (MSL) and the MT Base Map Service Center were made possible by federal, tribal, state, and local inter-agency data coordination and partnerships. MSL develops and maintains an extensive collection of Montana's geographically referenced information about the cultural and natural resources for the state. MSL staff also provides technical assistance and develops information discovery, access, analysis, and interpretation tools.

A key data source for this project was the Montana Cadastral system. Maintained by the Montana Department of Revenue, the counties and local governments, and the Montana Base Map Service Center and the Montana State Library, the MT Cadastral system was used for a variety of data sources. This data represents each private and public land parcel in the state. For all residential and commercial property, detailed data tables are attached forming the basis for the Montana Property Tax system. Many variables from these data were used in different content categories for the project http://geoinfo.montanastatelibrary.org/. The key data derived from this source include:

- The agricultural land type and base used for taxation
- The parcels and proportions of larger areas served by public and community water and sewer systems
- Primary source of energy for home and business heating and cooling
- Residential and commercial structures (these have been enhanced by multiple interagency efforts, moving structure points onto the structure using aerial and satellite imagery)
- Housing condition, approximate year built, other factors relating to potential for energy conservation and health hazards
- Unoccupied local government parcels with potential for economic development and public use such as recreation
- Conservation easements

The state library is also the repository and data portal for other data developed by state agencies and local governments. Many of the base layers we used for cartographic purposes and for analysis were acquired from the library. Details on each layer are available in the detailed data documentation and metadata. A small sample of these includes:

- Airports
- Brownfields
- Libraries
- Schools
- Wells
- Watersheds
- Areas with environmental health hazards sites from the Montana Department of Environmental Quality
- Transportation framework
- Administrative boundaries including school districts, fire districts, and others
- Dams
- Irrigation ditches and infrastructure from DNRC
- DEQ remediation sites
- Priority watersheds
- Minimum annual daily temperatures
- Wireless and wired broadband coverage
- Landfills

- Public water supply sources
- Noxious weeds
- Wind potential and wind speed averages
- Abandoned mines

A number of state data layers that are not presently housed or locatable in the stage geoportal maintained by the Montana State Library were also obtained. A representative sample of these include:

- Aquatic and Terrestrial wildlife data from Montana Dept. of Fish, Wildlife and Parks (CAPS)
- Wildland fire, wildland urban interface (WUI) from DNRC
- Active permitted gravel pits licensed by DEQ (supplemented by Infogroup gravel pit operators and the prime sand and gravel areas from the NRCS SSURGo soils maps)
- Grain elevators licensed by the Montana Dept. of Agriculture
- Oil and gas wells monitored by the Montana Board of Coal and Gas
- Household family size, HUD median household income limits
- Average annual precipitation

    a. Aspect/Slope/Steep Slopes
    National Elevation Dataset for Montana (2002)
    http://gisportal.msl.mt.gov/geoportal/catalog/search/resource/details.page?uuid=%7B8F3DF5E6-3D01-4FAC-AE68-2E10D92289BF%7D

    b. Census Block Group
    Montana Block Group Level Boundary File with selected Census 2010 Data
    http://gisportal.msl.mt.gov/geoportal/catalog/search/resource/details.page?uuid=%7B03E92B5C-337E-4A3F-ACF1-15150F0AAA42%7D

    c. Conservation Easements
    http://gisportal.msl.mt.gov/geoportal/catalog/search/resource/details.page?uuid=%7B9d69b262-b766-11e2-bc7e-f23c91aec05e%7D

    d. County Boundaries
    http://gisportal.msl.mt.gov/geoportal/catalog/search/resource/details.page?uuid=%7BB3682ED8-1D68-41F8-BAE6-14149C527EE4%7D

    e. County Seats
    http://gisportal.msl.mt.gov/geoportal/catalog/search/resource/details.page?uuid=%7B57B9F99A-FE8A-4A6D-BAAA-A7C335554105%7D

f. Dams
    http://gisportal.msl.mt.gov/geoportal/catalog/search/resource/details.page?uuid=%7B7E625984-A4D7-4AED-8ED8-713E1B1E3284%7D

g. Digital Elevation Model Data
    http://nris.mt.gov/nsdi/nris/el10/dems2.asp

h. Libraries in Montana Cities
    http://gisportal.msl.mt.gov/geoportal/catalog/search/resource/details.page?uuid=%7BB533B106-EE94-4049-9451-6C2A01A9F3C1%7D

i. Public Lands
    http://gisportal.msl.mt.gov/geoportal/catalog/search/resource/details.page?uuid=%7B60b5a8b0-b272-11e2-9e96-0800200c9a66%7D

j. SSURGO
    Soil Survey Geographic Data for Montana
    http://gisportal.msl.mt.gov/geoportal/catalog/search/resource/details.page?uuid=%7B812622e9-3e92-4d74-b84b-33e5b74f6a65%7D

k. State Boundary
    http://gisportal.msl.mt.gov/geoportal/catalog/search/resource/details.page?uuid=%7B448B1D3D-AB0C-4D31-B13A-C76B5D1F6257%7D

l. Structures
    http://geoinfo.montanastatelibrary.org/data/msdi/structures_addresses/

m. Towns
    http://gisportal.msl.mt.gov/geoportal/catalog/search/resource/details.page?uuid=%7BA0144C83-0F21-452D-8AC9-8CBD97E75C12%7D

XI. SAWG - DNRC STATEWIDE FOREST ASSESSMENT WORKING GROUP

a. Day Use Recreation Areas
    Day use recreation sites including: FWP site, fishing access, historic district, historic site, picnic area, roadside park, ski resorts, state park (no camping), trailhead. Sources for this point layer included developed recreation point layer (USFS), state parks, NPS & National Monuments, local government open space lands and parks. BLM Developed Recreation were not included but may be available in digital form from the BLM state office.

b. Public Overnight Recreation Areas
Overnight public recreation sites, including campgrounds, campsites, and state parks with camping.

c. Surface Fire
This map and model were prepared by the US Forest Service. It is based on a map effort by Mark Finney and Laurie Kirth at the National Fire Lab in Missoula. This process focuses on crown fires. The analysis methods include Monte Carlo runs for problem fires and took into account the last 20 years of actual fire history and behavior. This map was run for about two thirds of the total area of Montana in and around National Forest lands but did include all lands within that area, not just federal land.

XII.   USFS - US FOREST SERVICE

a. Recreation Trails
MT DNRC exported out trails from the composite roads and trails geodatabase for Region One of the US Forest Service.

XIII.   USGS - US GEOLOGICAL SURVEY

Federal data sources contributed to many of the data layers already discussed, such as the US Census, Housing and Urban Development, and the US Geological Survey. They also contributed to many of the state efforts and framework layers. For instance, the MT Dept. of Revenue agricultural land use classifications and the Montana residential and commercial structure locations were derived with imagery from the National Imagery Agricultural Program (NAIP) and National Elevation Data and NRCS SSURGO soils.   In addition, several key layers were acquired from federal sources not already mentioned.

- The National Dept. of Agriculture Agricultural Service and Census was used to map Landsat derived crop types (we mapped the top 10 of these including alfalfa, alfalfa non-hay, Duram wheat, spring and summer wheat, lentils, barley and fallow areas)
- The National hydrologic data set (streams, rivers and lakes) from USGS
- The significant and prime farmlands based on soil characteristics and potential productivity was derived from the SSURGO 1:24,000 scale NRCS soils database
- A surface fire probability map developed by the USFS Missoula Fire Lab and cooperators at the National Climate Center in Colorado
- National wetlands inventory

a. Impervious Surfaces
Percent of watershed based on count of area of impervious surfaces. This data was derived from a national US Geological Survey data set using Landsat satellite imagery with a 30 meter resolution, meaning the

smallest feature visible would be the size of a softball diamond. This map is intended to be used in urban forest management layers and should be used with caution. Most tree crowns are smaller than a softball diamond and when viewed from a satellite measuring a portion of the visible light spectrum, there is often a mixed value where trees overlap concrete or asphalt. The end result has mixed accuracy in urban areas.

b. Airports
http://gisportal.msl.mt.gov/geoportal/catalog/search/resource/details.page?uuid=%7B013376BE-3002-426E-A5E9-6C43EE033234%7D

XIV.   VF - VIBRANT FUTURES

Several transportation layers already mentioned were used for the transportation framework layer in the proximity analysis. Public transit stops and routes derived by public input and the local transportation districts were compiled into a map of routes and stops. Ridership data for these was provided by the Montana Transportation Institute at Montana State University. Average fuel and automotive expenditures were derived from Esri in sources documented above. A public survey administered by Vibrant Futures staff at all sponsored public meetings and published on the web since October, 2012, has gathered over 200 surveys asking community members to map their approximate home location and identify the towns in the region, or nearby the region, where they go for ten types of services ranging from where they go out to eat to where they go for medical services. These have been used to create "desire lines" or "spider maps" mapping where residents go for different types of services.

a. Transit Stops from Opportunity Link reports and staff
http://opportunitylinkmt.org/projects.php

XV.   WEB – Web Search

a. Wind Farm locations
http://www.naturener.net/rimrock
http://www.naturener.net/glacierwind1
http://www.exergydevelopment.com/projects/sites/horseshoe-bend