MASTER REQUIREMENTS LIST (FEATURES + COMPONENTS + PROJECTIONS)

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1. VECTOR BUFFER TOOL

Features:
- Multi-format input support (GeoJSON, SHP ZIP, KML, KMZ)
- Custom buffer distance (meters)
- Cap styles: Round, Flat, Square
- Join styles: Round, Bevel, Miter
- Multi-ring buffer generation
- Shape transformations: Rectangle, Oval, Diamond
- Automatic CRS projection (UTM)
- Export formats: GeoJSON, SHP ZIP, GPKG, KML, KMZ

Supported Projections:
- WGS84 (EPSG:4326)
- Web Mercator (EPSG:3857)
- UTM Zones (EPSG:32601–32660, North)
- UTM Zones (EPSG:32701–32760, South)
- India-specific projections:
  * EPSG:24378 – Kalianpur 1975 / UTM 43N
  * EPSG:24379 – Kalianpur 1975 / UTM 44N
  * EPSG:24382 – Kalianpur 1975 / India Zone I
  * EPSG:24383 – Kalianpur 1975 / India Zone IIa
  * EPSG:24384 – Kalianpur 1975 / India Zone IIIa
  * EPSG:24385 – Kalianpur 1975 / India Zone IVa

Components:
- Input parser & file-type detector
- CRS engine (detect → choose UTM → project → reverse project)
- Buffer engine (cap, join, rings)
- Shape transform engine
- Output serializers
- Web UI components

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2. LINE-FROM-POINTS GENERATOR

Features:
- Generate points by distance or percentage interval
- Supports units: meters, km, feet, miles
- Preserves line attributes
- Multi-format export

Projection Handling:
- Reproject to UTM for distance calculations

Components:
- Line reader
- Length calculator
- Unit converter
- Point interpolation engine
- Output writers

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3. POINT-TO-LINE CONVERTER

Features:
- Convert ordered points into lines
- Sorting by a field (timestamp, ID, chainage)
- Group by attribute to create multiple lines

Projection Handling:
- Works in source CRS
- Optional output CRS

Components:
- Attribute parser
- Group & sort engine
- LineString creator
- Output processors

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4. VECTOR GEOPROCESSING TOOL (CLIP / INTERSECT / UNION)

Features:

- Clip, Intersect, Union
- CRS alignment
- Dual-layer geoprocessing
- Multi-format output

Projection Handling:
- Reproject overlay layer to match input CRS
- Use projected CRS when necessary

Components:
- Layer loader
- CRS alignment engine
- Spatial geoprocessing engine
- Output writers

SHARED COMPONENTS (ALL TOOLS)

- File upload handler
- Geo format loader (GeoJSON, SHP, GPKG, KML, KMZ)
- CRS detection module
- Auto-selection of UTM projection
- Temporary file manager
- ZIP generator
- KML/KMZ processor
- Error handling module
- UI components (upload, params, download)