1. New features:
   • 4 modes of operation:
     • **Mark collisions**: when the current trace/via is violating the DRC rules, all colliding objects are highlighted in a very visible way.
     • **Walk around**: avoid obstacles, try to go around them.
     • **Shove**: brutally shove everything on the way.
     • **Figure out what’s best**: shove when necessary, walk around otherwise, backwards-scan parent PNS_NODEs to check if shove operations performed on them can be avoided for the current trace end point. In general: try to make as little mess on PCB as possible.
   • Support for shoving vias
   • Backpressure mode: tracks colliding with non-movable objects (pads, board edges) don’t jump over to the other side of the obstacle, but wrap around and “reflect” the collision towards the cursor.
   • Dragging trace segments, trace corners and vias, integrated in the Edit tool.
     Dragging supports mark obstacles and shove modes.
   • Dynamic loop removal (redundant traces are eliminated as you are routing, not after clicking)
   • Optimization effort adjustment (low/medium/heavy).
   • Auto-neckdown improvements (don’t mess up BGA fanouts, optimize only when the pad/via neckdown looks ugly – acute angles, don’t break traces that are almost straight)
   • Suggesting possible end of trace: while routing take the nearest yet unrouted pad and propose a trace between the cursor and that pad. Pressing F automatically finishes the trace.

2. Drag&drop tool integration:
   • Dragging a segment, via or trace corner invokes the P&S. The router performs the drag operation until the mouse button is clicked/released, updates the BOARD and returns to the caller tool.
   • Keeping up-to-date P&S model in the Edit tool:
     • dirty way: call PNS_ROUTER::SyncItem() on the items in the board that have been updated or PNS_ROUTER::SyncWorld() if the updates can’t be traced on per-item basis (performance penalty on larger designs due to rebuilding of the whole spatial index).
     • probably better: observer pattern in BOARD/BOARD_ITEM, may require significant rework.

3. Fixes:
   • Ratsnest: show only the ratsnest belonging to the net being routed.
   • Support for rounded rectangle (oblong) pads.
   • Initial support for rotated pads (maybe).
   • Don’t cross board edges when routing.
4. GUI
   - Preferences window & context menu (see drawings).
   - Quickly accessible dialogs with width/via size settings.
   - Proper UI control for number-with-units input (no more wxTextCtrl and a load of ReturnValueFromString() and friends)
   - Selecting layers, track widths and via sizes must not require any mouse movement. Width window has default focus on the width input. While routing, changing the width should only require typing (for example, to 20 mils: W 20 <ENTER>)

5. Not-for-this-release items
   - Keepout area support (requires polygons).
   - Blind/buried vias support.
   - Accordion routing / length matching.
   - Diff pairs.