Topological complexity is a fibrewise L-S category

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Topological complexity $TC(B)$ of a space B is introduced by M. Farber to measure how much complex the space is, which is first considered on a configuration space of a motion planning of a robot arm.We also consider a stronger version $TCM(B)$ of topological complexity with an additional condition: in a robot motion planning, a motion must be stasis if the initial and the terminal states are the same.Our main goal is to show the equalities $TC(B) = catBb(d(B))+1$ and $TCM(B) = catBB(d(B))+1$, where $d(B) = B\times B$ is a fibrewise pointed space over B whose projection and section are given by $p_{d(B)} = p_2 : B\times B \to B$ the canonical projection to the second factor and $s_{d(B)} = \Delta_B : B \to B\times B$ the diagonal. In addition, our method in studying fibrewise L-S category is able to treat a fibrewise space with singular fibres.